BARTEC

ANTARES Designer

User Manual Version 2.x.x.x.

BARTEC

User Manual – TRANSLATION

Configuration Software

ANTARES Designer

Version 2.x.x.x

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ANTARES Designer Software

Version 2.x.x.x

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1 Basic Safety Instructions

1.1 Notes on this User Manual

This user manual is an integral part of the product.

The user manual contains important information and safety instructions which are necessary to ensure that the device will function perfectly when operated.

Careful handling and the consistent observation of these instructions can prevent damage to property.

The illustrations in this manual serve to clarify the information and descriptions. They are not necessarily true to scale and may deviate slightly from the actual construction of the device/software.

Safety instructions and warnings are specially highlighted in this user manual and marked by symbols.

ATTENTION
ATTENTION identifies a potentially damaging situation, which if not avoided could damage the equipment or something in its environment.

Important instructions and information on effective, economical and environmentally compatible handling.

1.1.1 Languages

The original user manual was written in German. All other available languages are translations of the original user manual.

The user manual is available in German, English and French. If you require any other languages, please ask BARTEC or request them when placing the order.

1.1.2 Changes in the Document

BARTEC reserves the right to alter the contents of this document without notice. The correctness of the information is not guaranteed. In case of doubt, the German safety instructions shall apply because it is not possible to rule out errors in translation or printing. In the event of a legal dispute, the “General Terms and Conditions” of the BARTEC Group shall apply in addition.

The up-to-date versions of the data sheets, operating instructions, certificates and EC declarations of conformity can be downloaded from the “Automation Technology“ product page at www.bartec.de or ordered directly from BARTEC GmbH.

2 Software Installation

2.1 Requirements

2.1.1 Hardware (minimum)

- 50 MB of free hard disk storage
- Mouse
- Graphics resolution at least 1,024 x 768 pixels, 16-bit colour depth
- USB interface for connecting the ANTARES Remote I/O system
- Printer (local or in network)

2.1.2 Recommended System

- 100 MB hard disk storage
- Graphics resolution 1,280 x 1,024 pixels, 32-bit colour depth

2.1.3 Software

- Microsoft Windows 2000, Windows XP, Windows VISTA or Windows 7 operating system

2.1.4 Copyright

ATTENTION
This software is protected by copyright. By installing it, you automatically accept the conditions of the licence agreement.

2.1.5 Completion of the Registration Card

- not planned at the moment

2.2 Installation of the ANTARES Designer

A sub-directory into which all ANTARES Designer files will be written is created during the installation process.

(1) Before installing, make a back-up copy of any existing version of ANTARES Designer.

(2) Make sure that one of the following operating systems is installed:

- Microsoft Windows XP
- Microsoft Windows Vista
- Microsoft Windows 7

(3) Make sure you possess the necessary rights for installing the software.

(4) Start the installation.

(5) Follow the instructions in the installation software.

(6) The ANTARES Designer can be started via the Programs start menu.

Please refer to the Windows documentation for more explanations about Windows.

3 Software Description

The ANTARES Designer program package fulfils several functions:

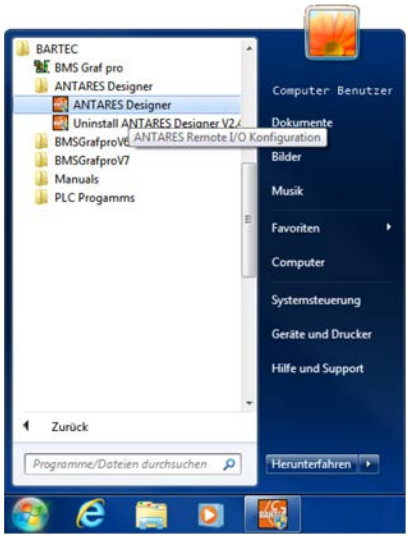
- creates an ANTARES Remote I/O system with a bill of materials generated from the project data.
  The bill of materials can be used for drawing up quotations also.

- configures the created ANTARES Remote I/O system.
  The configuration data is transferred into the ANTARES system.

- Configuration and diagnosis data can be read out and presented from the
  ANTARES Remote I/O system.

4 First Steps

4.1 Starting the Program



Start the program by clicking on the

"ANTARES Designer" icon

in the start menu.

- ▶ Programs
- ▶ BARTEC
- ▶ ANTARES Designer

If you are using Microsoft Windows Vista or Windows 7, you must run the software with administrator rights.

4.2 The Splash Screen

After boot-up, the "ANTARES Designer" initial screen appears. The “Welcome” window closes a few seconds later.

The status bar contains the following information:

- current time
- current date
- connection status

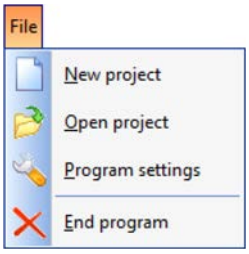
A screen resolution of 1,024 x 768 pixels is required.

It is much easier to operate the software if the resolution is 1,280 x 1,024 pixels or higher because it is then possible to have a complete view of the ANTARES system, which also facilitates editing.

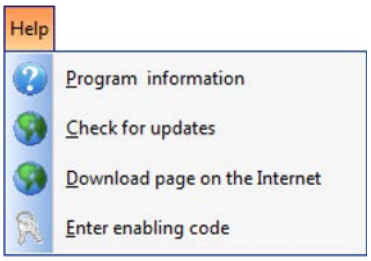
4.3 Menus and Toolbar

4.4 With Project Closed

4.4.1 Menu



New project	Starts the "Constructor" for a new project
Open project	Open an existing project
Program settings	e.g. select language Available languages: German, English, French, Italian, Portuguese (Brazilian), Spanish and Russian
End program	End the program



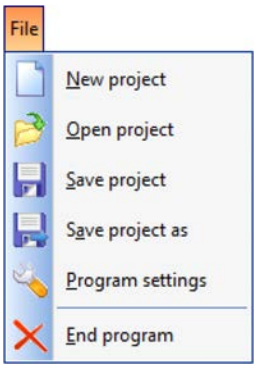
Program information	Information dialogue
Program information	Searches for updates
Download page on the Internet	Opens the download page with the Internet browser
Enter enabling code	Enable extended program functions

4.4.2 Toolbar

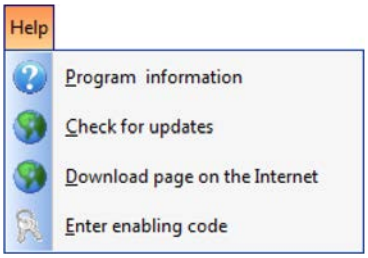
	Starts the "Constructor" for a new project
	Open an existing project
	ANTARES online diagnosis connection
	Information dialogue

4.5 With Project Opened

Menu



New project	Starts the "Constructor" for a new project
Open project	Open an existing project.
Save project	Saves the project on a data carrier
Save project as	Saves the project under a new name
Program settings	e.g. select language Available languages: German, English, French, Italian, Portuguese (Brazilian), Spanish and Russian
End program	End the program.



Program information	Information dialogue
Program information	Checks for updates
Download page on the Internet	Opens the download page with the Internet browser
Enter enabling code	Enable extended program functions.

4.5.1 Toolbar

	Starts the "Constructor" for a new project
	Open an existing project.
	Saves the project on data carriers.
	ANTARES online diagnosis connection
	Information dialogue

4.5.2 Toolbar "Project "

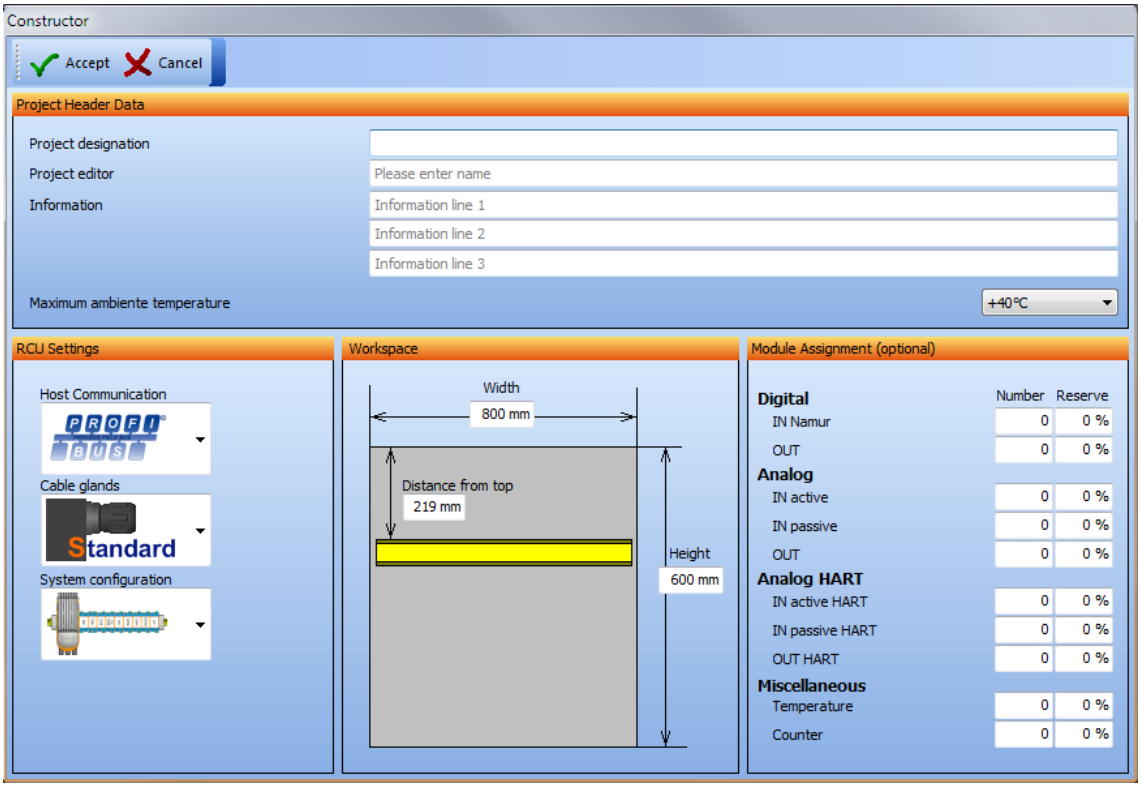
	Show/hide space requirements		Transfer the configuration into the ANTARES Remote I/O system
	Insert the workspace		Generate the ANATRES system report
	Insert mounting rail		Change the project header data
	Delete the highlighted element		

4.5.3 "Remote I/O Module" Toolbar

8DI	8 Digital In NAMUR	Digital input module 8-channel	NAMUR
16DI	16 Digital In NAMUR	Digital input module 16-channel	NAMUR
8DO	8 Digital Out	Digital output module 8-channel	Total current limitation
8DO SCL	8 Digital Out SCL	Digital output module SCL 8-channel	Individual channel current limitation
8AI	8 Analog In	Analog input module 8-channel	4 to 20 mA
8AIH	8 Analog In HART	Analog input module HART 8-channel	4 to 20 mA
4AIO	4 Analog In/Out	Analog in/output module 4-channel	0 to 20 mA, 4 to 20 mA
4AIOH	4 Analog In/Out HART	Analog in/output module HART 4-channel	0 to 20 mA, 4 to 20 mA
4TI	4 Temperature In	Temperature input module 4-channel	Pt100, Pt 1000, Potentiometer

5 Creating a Project

5.1 Constructor



5.1.1 Selection Fields

Project header data

- Project designation
- Project editor
- Information
- Maximum ambient temperature (inside the protective equipment!)

RCU Settings

- Host communication (type of bus activation)
- Cable gland (armoured, non-armoured cable glands)
- System design (a redundant system design is only possible with a PROFIBUS DP)

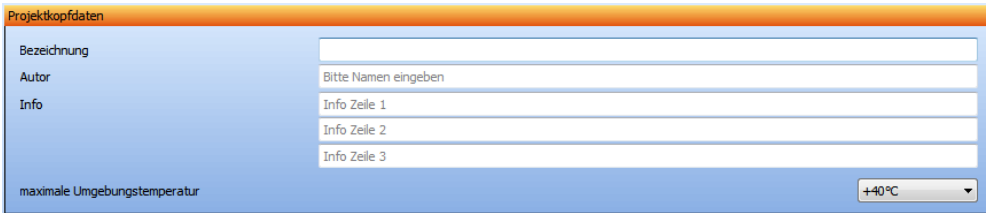
Workspace

- Dimensions: width, height, distance from the top

Module assignment optional

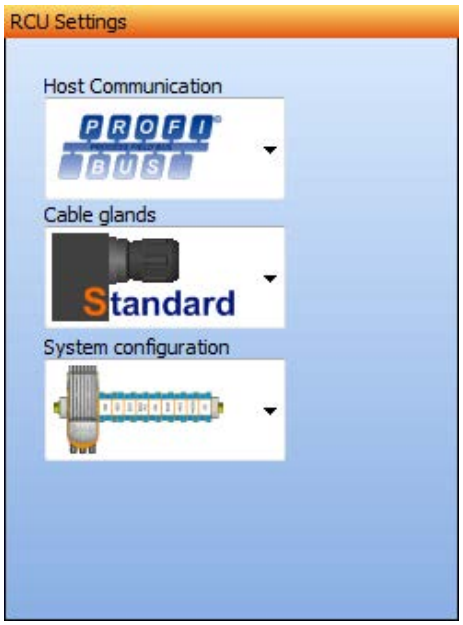
- Module selection: digital and analog in/outputs, other modules

5.1.2 "Project Header Data" Selection Field



Selection field for filing general information and basic details on the system.

5.1.3 "RCU Settings" Selection Field



Host communication

The ANTARES Remote I/O system has the following process connections:

- EtherNet/IP
- Modbus TCP
- PROFINET
- PROFIBUS

Selection of the cable glands

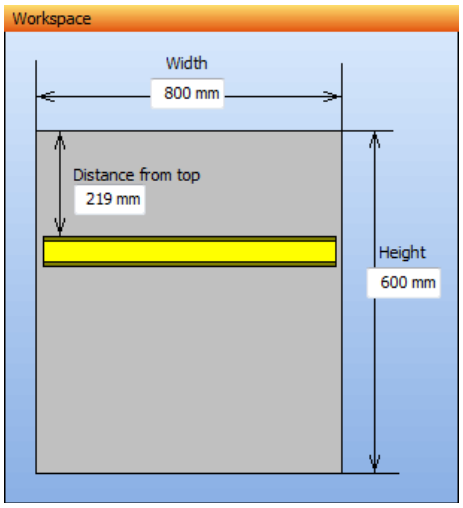
- for non-armoured cables
- for armoured cables

System Configuration

The ANTARES system configuration is possible as single or redundant operation.

▶ The redundancy operation is exclusively for the variant with PROFIBUS DP!

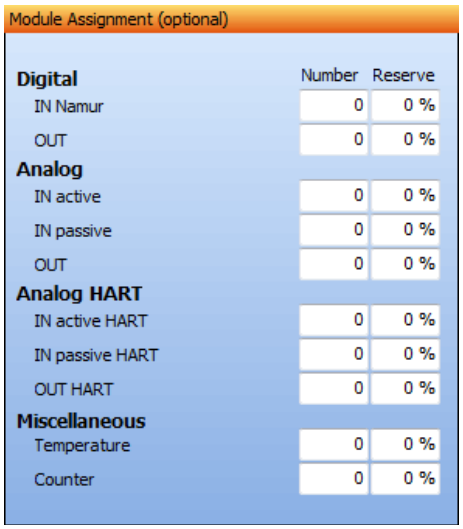
5.1.4 "Workspace" Selection Field



Displays the workspace on the project screen.

If the workspace has been defined, the project screen shows if the system needs to be distributed onto one or more than one mounting rail (a maximum of 3 mounting rail transition sections are possible).

5.1.5 "Module Assignment" Selection Field



There is an optional possibility of entering the various parameters for the input and output channels required in the system.

The "Constructor" creates a system based on the required number of types of channels plus reserve.

If the operating parameters are adhered to, the constructor configures the ANTARES system automatically.

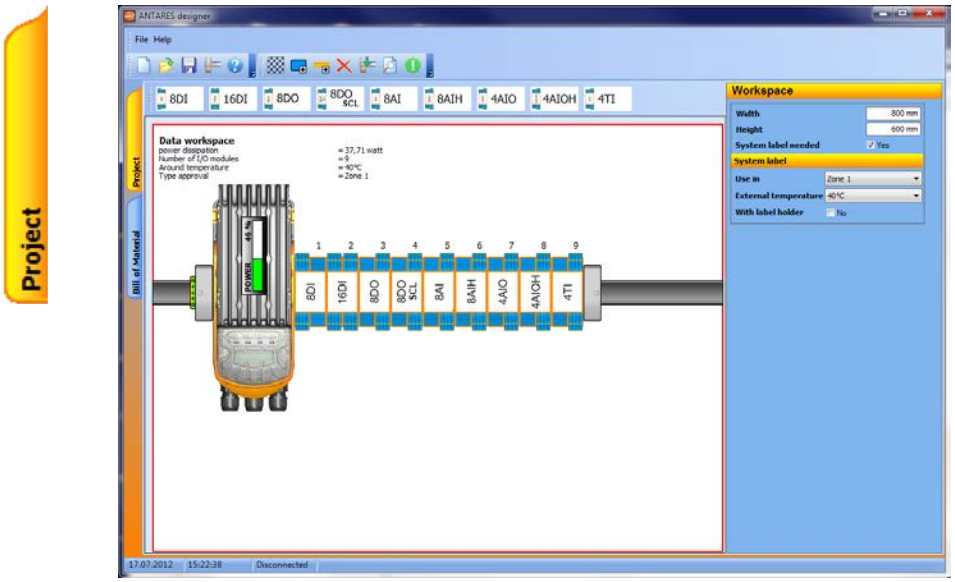
Changes can be made at any time when creating with the constructor.

It is not possible to generate a system configuration if the number of channels exceeds the maximum values in a system.

▶ See the following pages for detailed information.

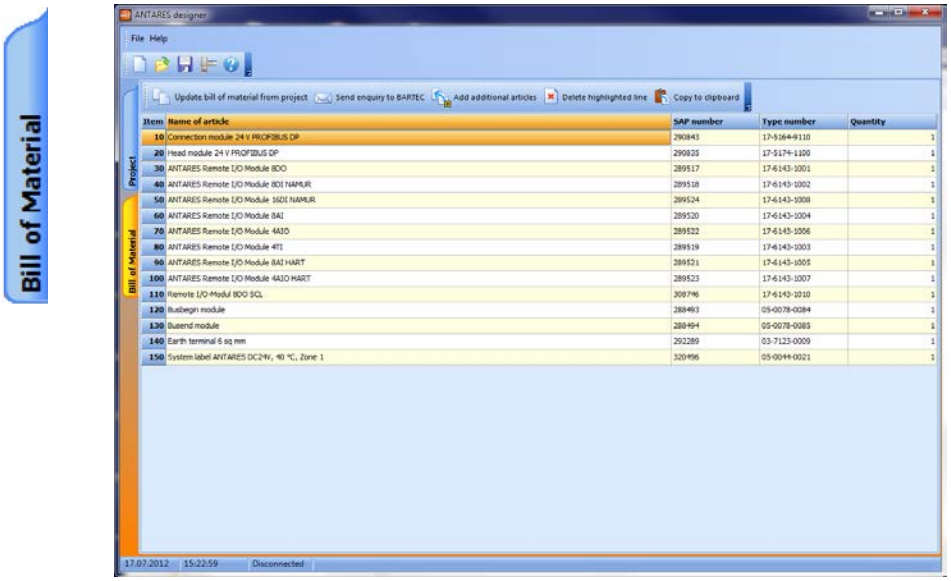
5.2 Assembling the ANTARES Remote I/O system

5.2.1 "Project" Tab



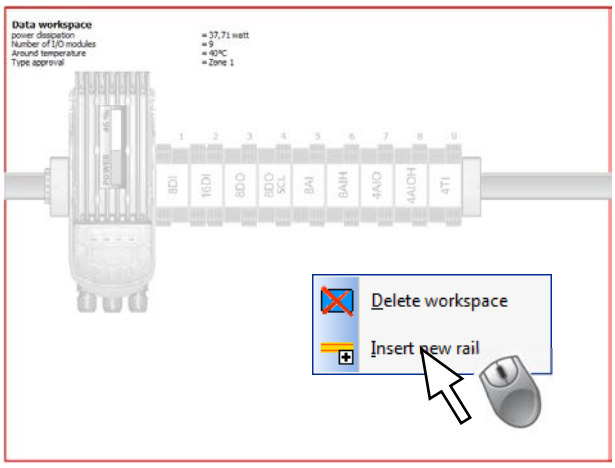
- System overview
- Host communication setting
- Inserting /removing/changing Remote I/O modules
- Positioning the Remote I/O modules
- Adjusting the Remote I/O modules

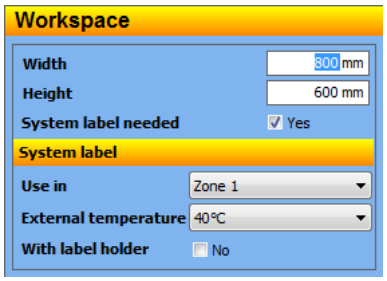
5.2.2 "Bill of Materials" Tab



- List of all components
- Inserting additional accessories
- Requesting a quotation via e-mail

5.2.3 Workspace

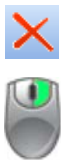




"Workspace" Selection Window

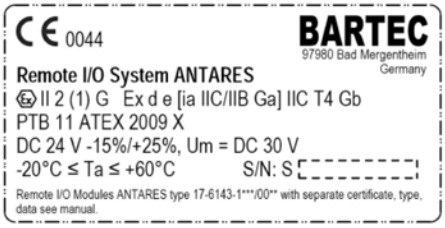
The highlighted workspace is marked with a red frame line and shows the available area.

It is possible to create several workspaces and distribute the ANTARES Remote I/O system.

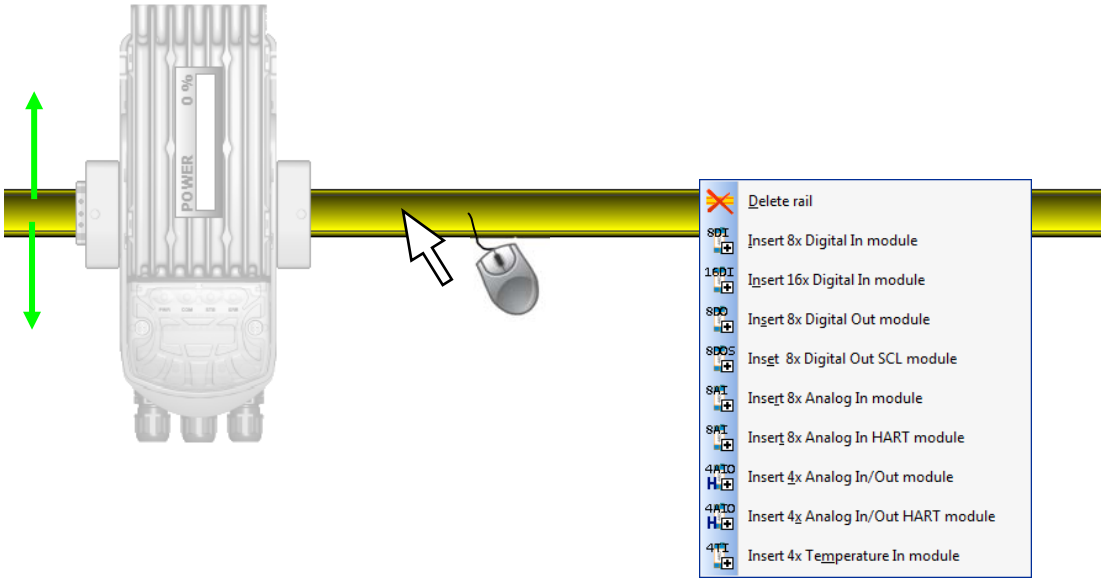
Inserting the workspace	▶ Select the “insert workspace” symbol from the toolbar **or** ▶ open the context menu by right-clicking on the mouse outside the workspace.
Delete the highlighted workspace. 	▶ Select the "Delete highlighted element" symbol from the toolbar **or** ▶ open the context menu by right-clicking on the mouse inside the workspace.
Define the size of the workspace	▶ Select the area of the workspace by left-clicking on the mouse. ▶ Decide on the width and height in the "Workspace" selection window.

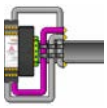
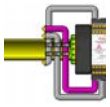
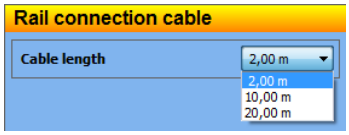
Each ANTARES Remote I/O system requires a system label and a suitable label holder and can be assigned to the respective workspace.

▶ Observe the ANTARES system description!

Example of system label:  CE 0044 BARTEC 97980 Bad Mergentheim Germany Remote I/O System ANTARES II 2 (1) G Ex d e [ia IIC/IIB Ga] IIC T4 Gb PTB 11 ATEX 2009 X DC 24 V -15%/+25%, Um = DC 30 V -20°C ≤ Ta ≤ +60°C S/N: S Remote I/O Modules ANTARES type 17-6143-1***/00** with separate certificate, type, data see manual.	Required details: - Ex-Zone, max. external temperature (outside the protective equipment) The label holder must fulfil certain requirements in the hazardous area and it should be ordered at the same time. The customer-specific details generate the accessory for the bill of materials.

5.2.4 Mounting Rail

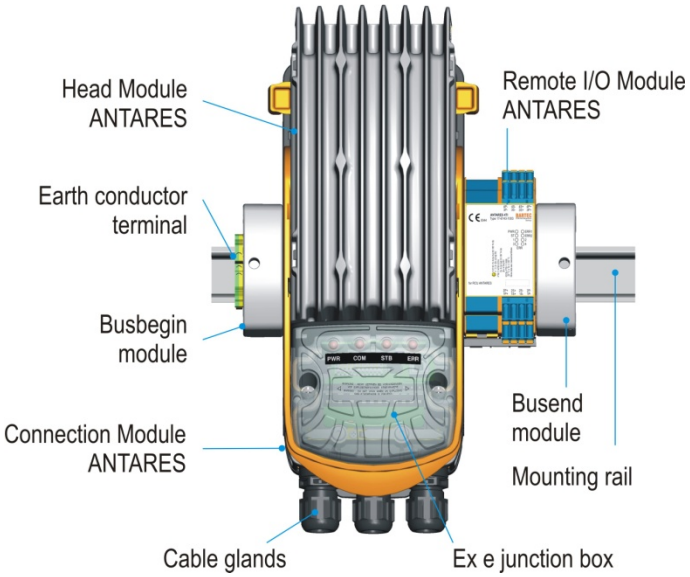

0 %
POWER
Delete rail
Insert 8x Digital In module
Insert 16x Digital In module
Insert 8x Digital Out module
Inset 8x Digital Out SCL module
Insert 8x Analog In module
Insert 8x Analog In HART module
Insert 4x Analog In/Out module
Insert 4x Analog In/Out HART module
Insert 4x Temperature In module

Moving the mounting rail	▶ Position the mouse on the mounting rail and move the mounting rail upwards or downwards by right-clicking on the mouse. Take the modules' space requirements into account!
Inserting the mounting rail	▶ Position the mouse in the workspace and select the "Insert mounting rail" symbol from the toolbar or ▶ open the context menu by right-clicking on the mouse inside the workspace.
Inserting the mounting rail transitional section  	The ExtSet is inserted automatically if a new mounting rail is selected. ▶ Specification of the lead length (total length 20 m !) - 2.00 m - 10.00 m - 20.00 m 
Deleting the mounting rail	▶ Select the "Deleting the mounting rail" symbol from the toolbar or ▶ open the context menu by right-clicking on the mounting rail.

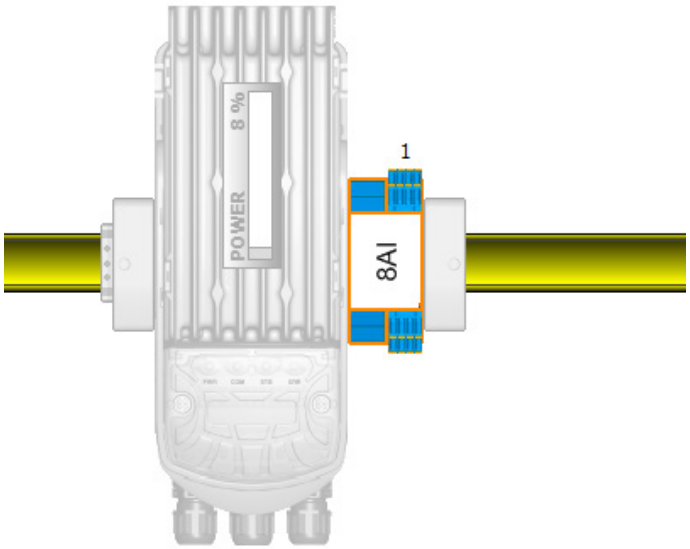
It is only possible to delete mounting rails from the workspace if there are no modules installed in a row on it.

5.2.5 Placing the Remote I/O modules on the Mounting Rail

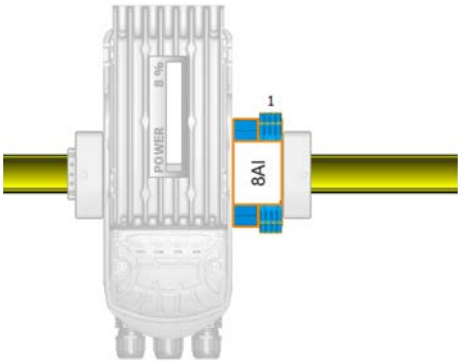
The representation in the workspace shows the system configuration of the remote I/O system.



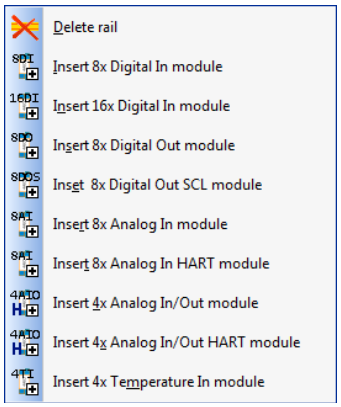
The earthing terminal, bus beginning module, RCU and bus end module are integral components in the system configuration by the ANTARES Designer. The mounting rail allows the installation of up to 32 Remote I/O modules on the right-hand side of the RCU. There are currently 9 different Remote I/O modules available.



When a remote I/O module is being inserted, the ANTARES Designer checks the various parameters, such as ambient temperature, power dissipation, lead lengths between the mounting rail, maximum current and the required current consumption. A message appears if any of the parameters is exceeded.



Context menu:

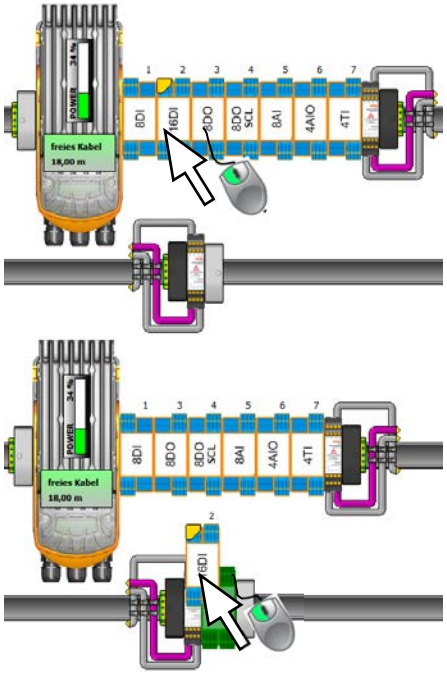


Module tool bar

Inserting the Remote I/O modules

- ▶ Highlight the mounting rail and select the Remote I/O module from the module tool bar by mouse click or
- ▶ open the context menu by right-clicking on the mounting rail.

Moving the remote I/O module



- ▶ Highlight the remote I/O module by left-clicking on the mouse and keeping it depressed.
- ▶ Move the module to the required position (possible on / to all mounting rails)

  Target position = green area
- ▶ Release the mouse button once the target position is reached.

Moving the modules also changes the position of the input and output data for the control!

6 Parameter Assignment for RCU and Remote I/O modules

6.1 ANTARES RCU (Rail Control Unit)

Host communication

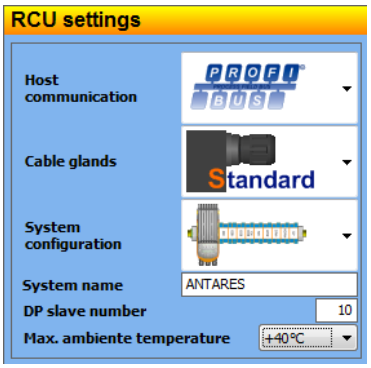
The ANTARES Remote I/O system has the following process connections:

- EtherNet/IP
- MODBUS TCP
- PROFINET
- PROFIBUS

Selecting the cable glands

- for non-armoured cables
- for armoured cables

Host communication with PROFIBUS DP



System name

xxx

System configuration

Redundancy

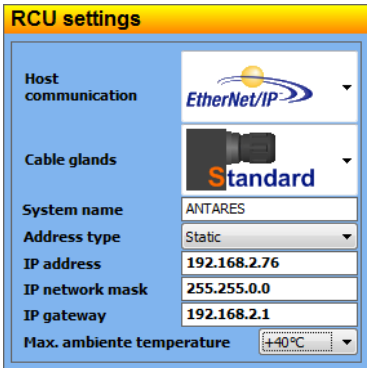
DP slave number

of the PROFIBUS

Max. ambient temperature

+40 °C, +50 °C or +60 °C

Host communication with EtherNet/IP and ModbusTCP



System name

xxx

Address type

Static, DHCP

IP address

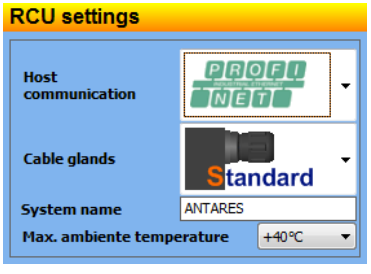
IP network mask

IP gateway

Max. ambient temperature

+40 °C, +50 °C or +60 °C

Host communication with PROFINET



System name

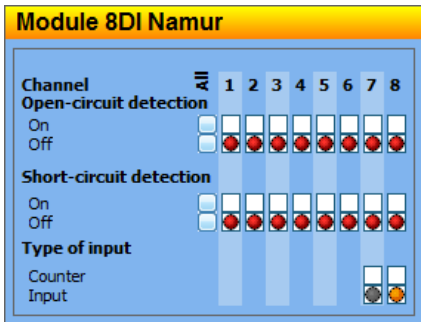
xxx

Max. ambient temperature

+40 °C, +50 °C or +60 °C

6.2 Remote I/O modules

6.2.1 ANTARES Remote I/O Module 8DI



Open-circuit detection	Input for channel-dependent activation
Short-circuit detection	
Type of input	Behaviour of the outputs if there is a loss of communication

If the channel 8 is set as a counter, the databit for channel 8 is always a “0”.
In the transitional area, however, the “Counter 1” value is represented. Channel 7 can be activated as a counter only if Channel 8 is a counter already. In the transitional area channel 7 corresponds to the “counter 2” value.

▶ See Chapter 4.

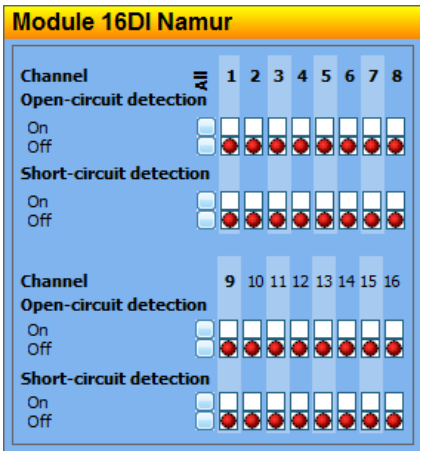
Process data input

Byte	Data type	No counter	One counter	Two counters	Description/ Values
1	byte	Bit 0 = channel 1 … … … Bit 7 = channel 8	Bit 0 = channel 1 … … … Bit 7 = always 0	Bit 0 = channel 1 … Bit 5 = channel 6 Bit 6 = always 0 Bit 7 = always 0	Digital input value
2-5	Int32		31-bit + overflow (bit 31) of counter 1 (8)	31-bit + reset overflow (bit 31) of the counter 1 (8)	Digital input value
6-9	Int32			31-bit + reset overflow (bit 31) of the counter 2 (7)	Digital input value

Process data output

Byte	Data type	No counter	One counter	Two counters	Description/ Values
1	byte		Bit 0 = reset Counter 1 Bit 1 = start/stop Bit 2 = overflow Bit 3 = reserved Bit 4 = reserved Bit 5 = reserved Bit 6 = reserved Bit 7 = reserved	Bit 0 = reset Counter 1 Bit 1 = start/stop Bit 2 = reset overflow Bit 3 = reset counter2 Bit 4 = start/stop Bit 5 = reset overflow Bit 6 = reserved Bit 7 = reserved	Digital input value

6.2.2 ANTARES Remote I/O Module 16DI

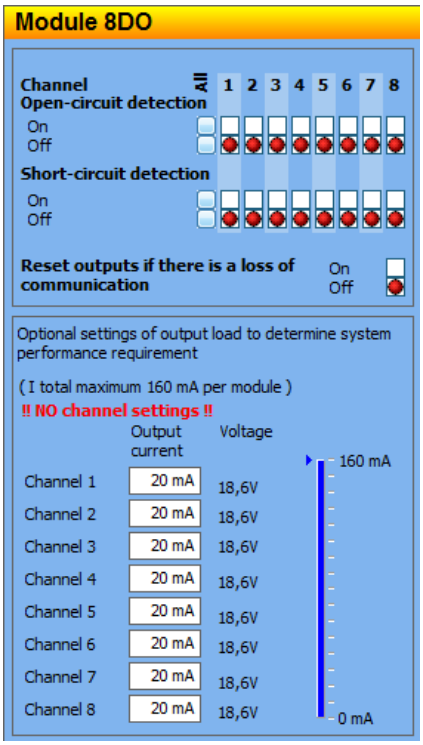


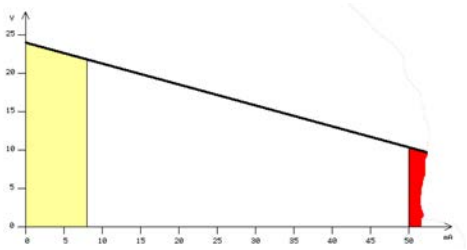
Open-circuit detection	Input for channel-dependent activation
Short-circuit detection	

Process data input

Byte	Data type	Inputs	Description/values
1-2	Word16	Bit 0 = channel 1 Bit 1 = channel 2 … … … Bit 14 = channel 15 Bit 15 = channel 16	Digital input value

6.2.3 ANTARES Remote I/O Module 8DO





Open-circuit detection:
in the range 0 to approx. 8 mA

Short-circuit detection:
above approx. 50 mA

Open-circuit detection	Input for channel-dependent activation
Short-circuit detection	
Reset outputs if there is a loss of communication	Behaviour of the outputs if there is a loss of communication
Optional setting of the output load …	Optional calculation of the output load

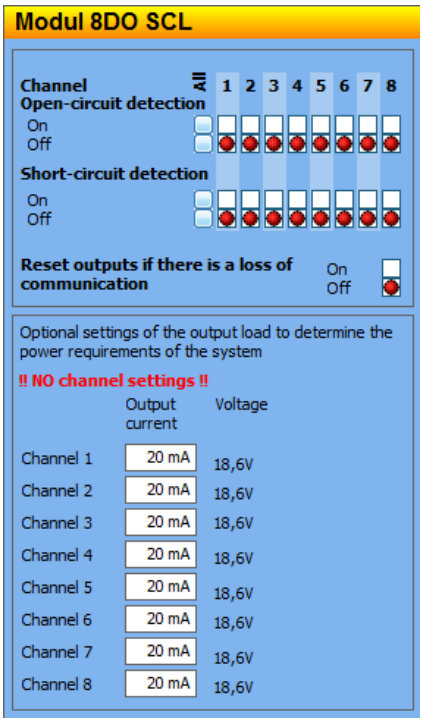
Each of the outputs can be subjected to a load of up to approx. 40 mA. The possible total current is limited to 160 mA (calculation of the output load integrated). If a channel is subjected to a load, a particular total current arises and the output voltage varies at this channel. On the basis of the characteristics data of the fitted barrier, the software calculates the output voltage that arises.

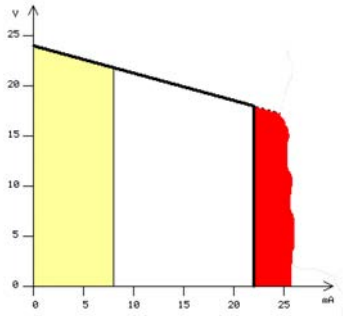
The software also uses the total current to calculate the overall current required by the system. No details are transferred into the ANTARES Remote I/O system. If other output values are used in the system, the ANTARES system can still work correctly as long as no limit values (total current and max. total current) are exceeded.

Process Data Output

Byte	Data type	Inputs	Description/values
1-2	byte	Bit 0 = channel 1 Bit 1 = channel 2 … … Bit 7 = channel 8	Digital output value

6.2.4 ANTARES Remote I/O Module 8DO SCL





Open-circuit detection:
in the range from 0 to approx. 8 mA

Short-circuit detection:
above approx. 22 mA

Open-circuit detection	Input for channel-dependent activation
Short-circuit detection	
Reset outputs if there is a loss of communication	Behaviour of the outputs if there is a loss of communication
Optional setting of the output load...	Optional calculation of output load

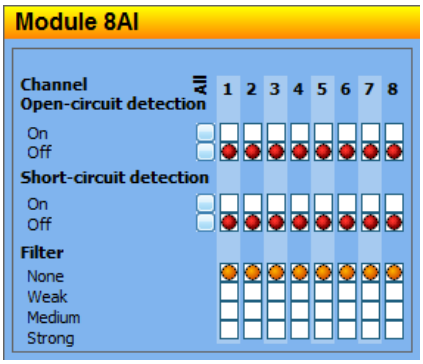
Each output is limited to 20 mA (output load calculation integrated). If a channel is subjected to a load, an output voltage arises at the channel. The software calculates the arising output voltage on the basis of the characteristics data of the fitted barrier.

The software uses these details only for display. No details are transferred into the ANTARES Remote I/O system.

Process data output

Byte	Data type	Inputs	Description/values
1-2	byte	Bit 0 = channel 1 Bit 1 = channel 2 … … Bit 7 = channel 8	Digital output value

6.2.5 ANTARES Remote I/O Module 8AI



Open-circuit detection	Input for channel-dependent activation
Short-circuit detection	
Filter	Average of the 1, 4, 16 or 64 values

The ANTARES Remote I/O Module 8AI is only for passive sensors. It does not permit any switchover between 0-20 mA and 4-20 mA because 4-20 mA is always necessary.

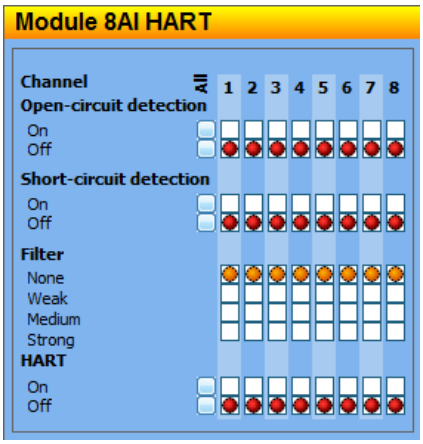
Process data input

Byte	Data type	Description/values	
1-2	Int 16	Analog In 1	Analog input value 15 bit + sign (see value range table)
3-4	Int 16	Analog In 2	Analog input value 15 bit + sign (see value range table)
5-6	Int 16	Analog In 3	Analog input value 15 bit + sign (see value range table)
7-8	Int 16	Analog In 4	Analog input value 15 bit + sign (see value range table)
9-10	Int 16	Analog In 5	Analog input value 15 bit + sign (see value range table)
11-12	Int 16	Analog In 6	Analog input value 15 bit + sign (see value range table)
13-14	Int 16	Analog In 7	Analog input value 15 bit + sign (see value range table)
15-16	Int 16	Analog In 8	Analog input value 15 bit + sign (see value range table)

Value range for analog values

Current	Range 0...20 mA		Range 4...20 mA		Value in the event of a short-circuit : $7FFF_{Hex}$
21.8 mA	$75B9_{Hex}$	30137	7827_{Hex}	30759	
20 mA	$6C00_{Hex}$	27648	$6C00_{Hex}$	27648	
4 mA			0000_{Hex}	0	Value in the event of a wire break 8000_{Hex}
0 mA	0000_{Hex}	0	$E500_{Hex}$	-6912	

6.2.6 ANTARES Remote I/O Module 8AI HART



Open-circuit detection	Input for channel-dependent activation
Short-circuit detection	
Filter	Average of the 1, 4, 16 or 64 values
HART	Activation of the HART function

ANTARES Remote I/O Module 8AI HART is only for passive sensors. It does not permit any switchover between 0-20 mA and 4-20 mA because 4-20 mA is always necessary.

In the event of an activated HART function, a HART sensor/actuator can be activated. The ANTARES Remote I/O system takes over the functioning of a HART gateway.

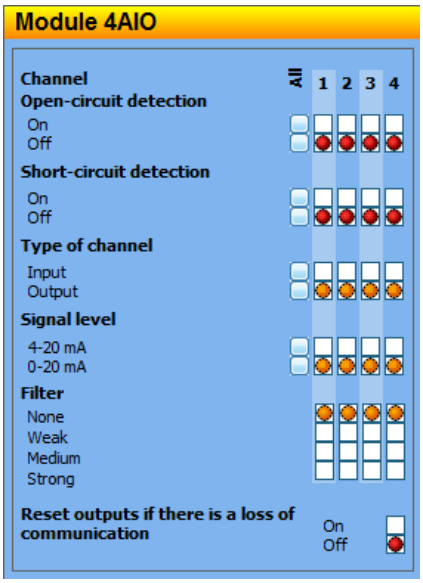
Process data input

Byte	Data type	Description/ values	
1-2	Int 16	Analog In 1	Analog input value 15 bit + sign (see value range table)
3-4	Int 16	Analog In 2	Analog input value 15 bit + sign (see value range table)
5-6	Int 16	Analog In 3	Analog input value 15 bit + sign (see value range table)
7-8	Int 16	Analog In 4	Analog input value 15 bit + sign (see value range table)
9-10	Int 16	Analog In 5	Analog input value 15 bit + sign (see value range table)
11-12	Int 16	Analog In 6	Analog input value 15 bit + sign (see value range table)
13-14	Int 16	Analog In 7	Analog input value 15 bit + sign (see value range table)
15-16	Int 16	Analog In 8	Analog input value 15 bit + sign (see value range table)

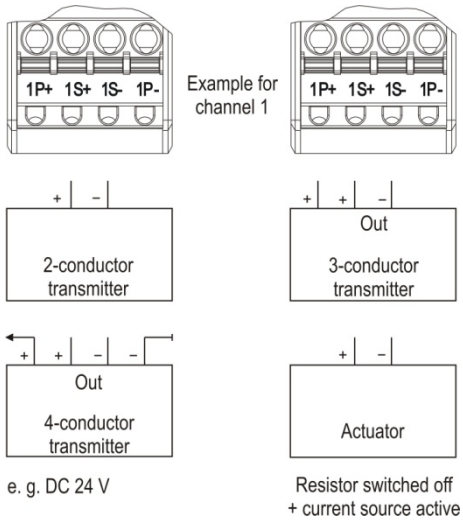
Value ranges for analog values

Current	Range 0...20 mA		Range 4...20 mA		Value in the event of a short-circuit: $7FFF_{Hex}$
21.8 mA	$75B9_{Hex}$	30137	7827_{Hex}	30759	
20 mA	$6C00_{Hex}$	27648	$6C00_{Hex}$	27648	
4 mA			0000_{Hex}	0	Value in the event of a wire break 8000_{Hex}
0 mA	0000_{Hex}	0	$E500_{Hex}$	-6912	

6.2.7 ANTARES Remote I/O Module 4AIO



Terminal assignment:



*

Open-circuit detection	Input for channel-dependent activation
Short-circuit detection	
Type of channel	Input/output
Signal level	0-20 mA or 4-20 mA
Filter	0, 4, 16 or 64 values
Reset outputs if there is a loss of communication	Behaviour of the outputs if there is a loss of communication

The ANTARES Remote I/O module 4AIO is for passive and active sensors. It is possible to switch between the signal levels. The 0-20 mA signal is not possible with open-circuit monitoring.

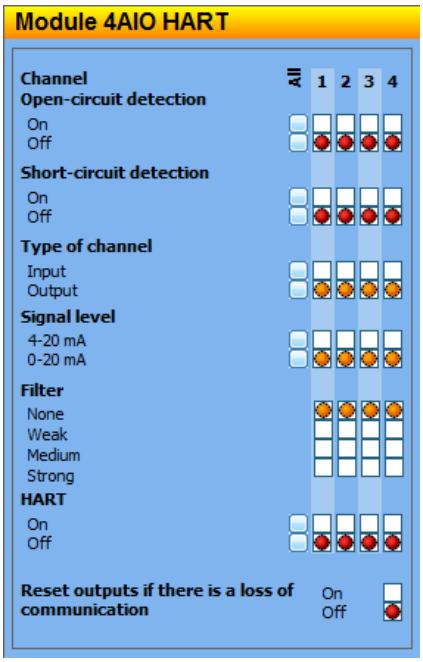
Process data input/output

Byte	Data-type	4 x outputs no output		3 x outputs 1 x input		2 x outputs 2 x inputs		1 x output 3 x inputs		no output 4 x inputs	
		in	out	in	out	in	out	in	out	in	out
1-2	Int16		X	X	X	X	X	X	X		X
3-4	Int16		X		X	X	X	X			X
5-6	Int16		X		X			X			X
7-8	Int16		X								X

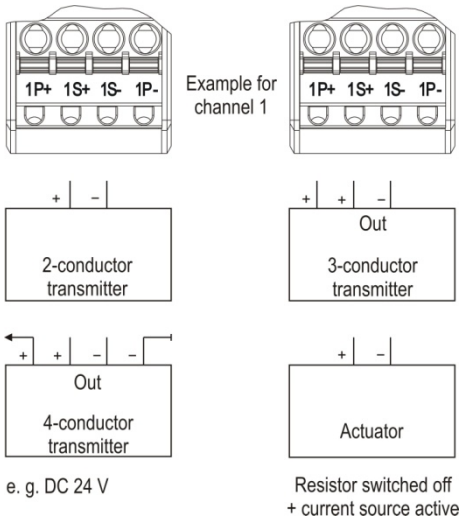
Range of analog values

Current	Range 0...20 mA		Range 4...20 mA		
21.8 mA	$75B9_{Hex}$	30137	7827_{Hex}	30759	Value in the event of a short-circuit: $7FFF_{Hex}$
20 mA	$6C00_{Hex}$	27648	$6C00_{Hex}$	27648	
4 mA			0000_{Hex}	0	Value in the event of an open circuit 8000_{Hex}
0 mA	0000_{Hex}	0	$E500_{Hex}$	-6912	

6.2.8 ANTARES Remote I/O Module 4AIO HART



Terminal assignment:



Open-circuit detection	Input for channel-dependent activation
Short-circuit detection	
Type of channel	Input or output
Signal level	0-20 mA or 4-20 mA
Filter	0, 4, 16 or 64 values
HART	Activation of the HART function
Reset outputs if there is a loss of communication	Behaviour of the outputs if there is a loss of communication

The ANTARES Remote I/O module 4AIO is for passive and active sensors. It is possible to switch between the signal levels. In the event of open-circuit monitoring, the 0-20 mA signal is not possible. If a HART function is activated, a HART sensor/actuator can be addressed. The ANTARES system takes over the function of a HART gateway.

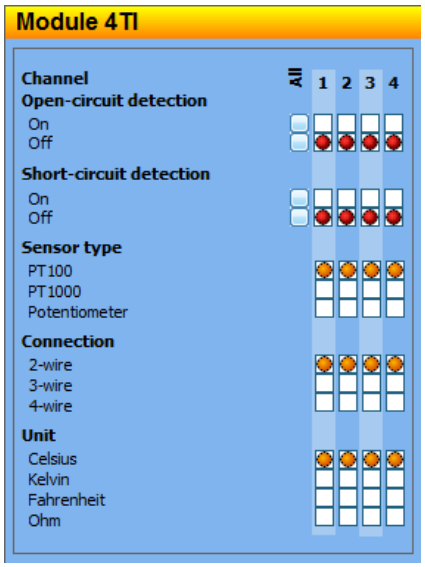
Process data input/output

Byte	Data-type	4 x outputs no output		3 x outputs 1 x input		2 x outputs 2 x inputs		1 x output 3 x inputs		no output 4 x inputs	
		in	out	in	out	in	out	in	out	in	out
1-2	Int16		X	X	X	X	X	X	X		X
3-4	Int16		X		X	X	X	X			X
5-6	Int16		X		X			X			X
7-8	Int16		X								X

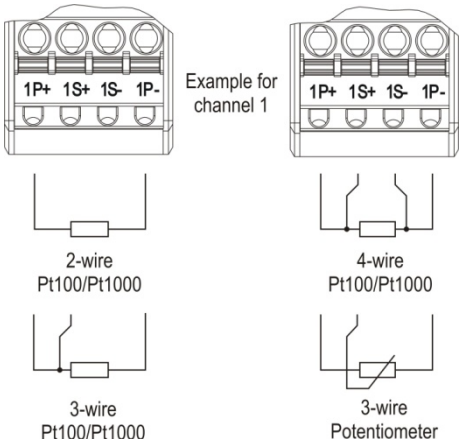
Range of analog values

Current	Range 0...20 mA		Range 4...20 mA		
21.8 mA	$75B9_{Hex}$	30137	7827_{Hex}	30759	Value in the event of a short-circuit: $7FFF_{Hex}$
20 mA	$6C00_{Hex}$	27648	$6C00_{Hex}$	27648	
4 mA			0000_{Hex}	0	Value in the event of an open circuit: 8000_{Hex}
0 mA	0000_{Hex}	0	$E500_{Hex}$	-6912	

6.2.9 ANTARES Remote I/O Module 4TI



Terminal assignment:



Open-circuit detection	Input for channel-dependent activation
Short-circuit detection	
Sensor type	PT100, PT1000 or potentiometer
Connection	2-, 3- or 4-conductor
Unit	Measurement in Celsius, Kelvin, Fahrenheit or Ohm

For the potentiometer, the unit is the ohm.

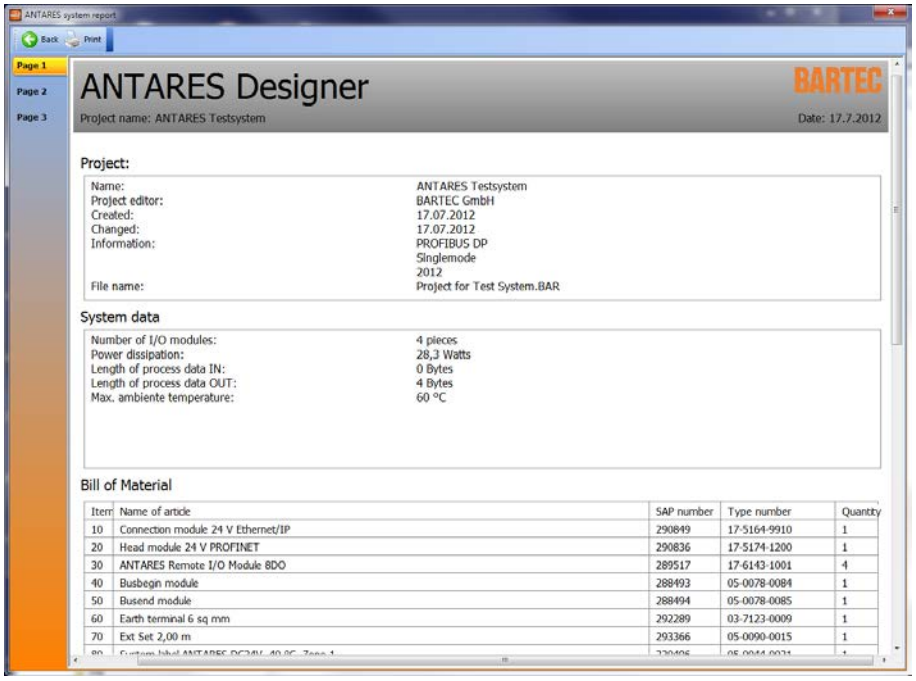
Process data input

Byte	Data type	Description / values
1-2	Int16	Temperature 1 Unit of measurement x factor 10 as a 16-bit value of channel 1
3-4	Int16	Temperature 2 Unit of measurement x factor 10 as a 16-bit value of channel 2
5-6	Int16	Temperature 3 Unit of measurement x factor 10 as a 16-bit value of channel 3
7-8	Int16	Temperature 4 Unit of measurement x factor 10 as a 16-bit value of channel 4
Value in the event of a short-circuit: 8000_{Hex} Value in the event of an open circuit: $7FFF_{Hex}$		

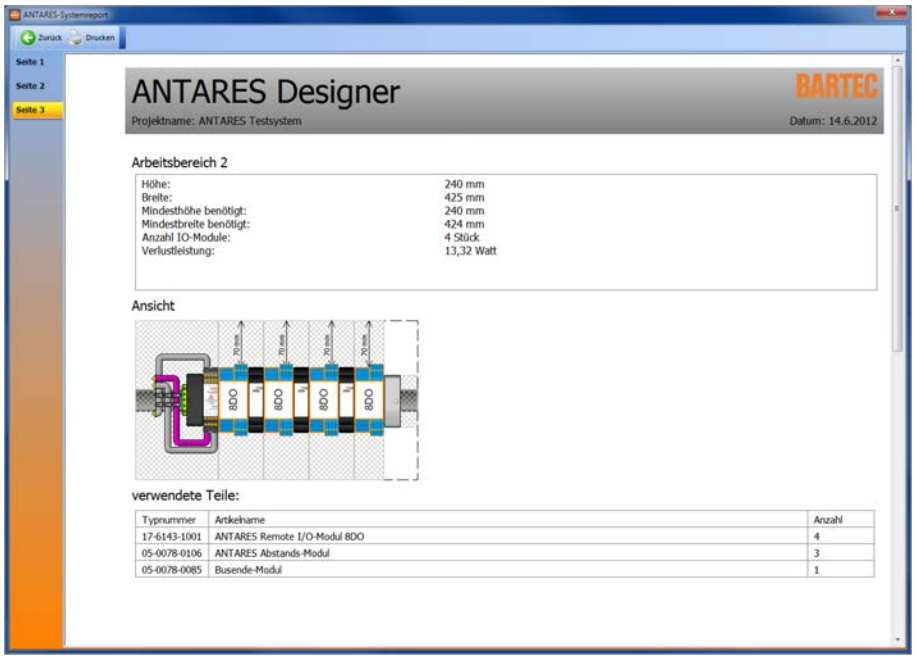
With ohm = unit of measurement x 1

7 ANTARES System Report

▶ Overview with display of project data and total bill of materials

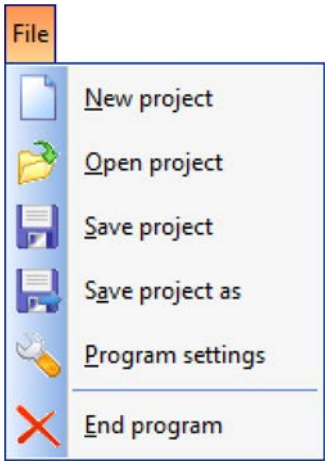

ANTARES system report
Back
Print
Page 1
Page 2
Page 3
ANTARES Designer
BARTEC
Project name: ANTARES Testsystem
Date: 17.7.2012
Project:
Name: ANTARES Testsystem
Project editor: BARTEC GmbH
Created: 17.07.2012
Changed: 17.07.2012
Information: PROFIBUS DP
Singlemode
2012
File name: Project for Test System.BAR
System data
Number of I/O modules: 4 pieces
Power dissipation: 28,3 Watts
Length of process data IN: 0 Bytes
Length of process data OUT: 4 Bytes
Max. ambiente temperature: 60 °C
Bill of Material
Item | Name of article | SAP number | Type number | Quantity
10 | Connection module 24 V Ethernet/IP | 290849 | 17-5164-9910 | 1
20 | Head module 24 V PROFINET | 290836 | 17-5174-1200 | 1
30 | ANTARES Remote I/O Module 8DO | 289517 | 17-6143-1001 | 4
40 | Busbegin module | 288493 | 05-0078-0084 | 1
50 | Busend module | 288494 | 05-0078-0085 | 1
60 | Earth terminal 6 sq mm | 292289 | 03-7123-0009 | 1
70 | Ext Set 2,00 m | 293366 | 05-0090-0015 | 1

▶ The following pages contain for each workspace a work report of the parts used and the data relevant for the configuration.



▶ Prints the system report.

8 Transferring the Project



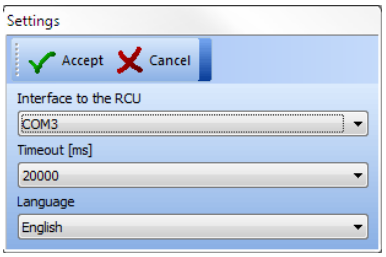
The ANTARES Remote I/O system is equipped with a USB interface. If connected to the PC, a virtual COM interface is generated on the PC.

Transferring requires a USB-B type of USB cable (not included in the scope of supply).

It may be necessary to install the USB driver for the virtual COM.

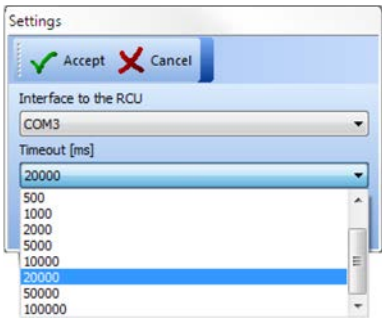
In the directory:
C:\Programs(x86)\BARTEC\ANTARES_Designer\USB“
or alternatively under:
http://www.bartec.de/automation-download

8.1 Program Settings



Interface to the RCU

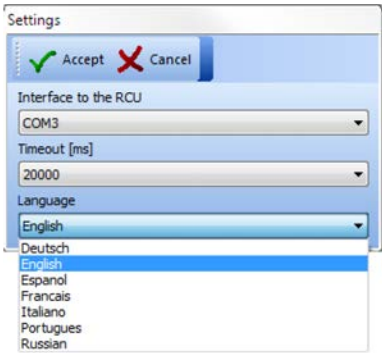
Virtual COM interface in the PC. Only interfaces which are identified by the operating system as “enabled” can be selected.



Timeout

Settings of the maximum waiting time for an answer protocol if there is communication with the ANTARES Remote I/O system.

Changes in systems with a large number of Remote I/O modules may be possible.

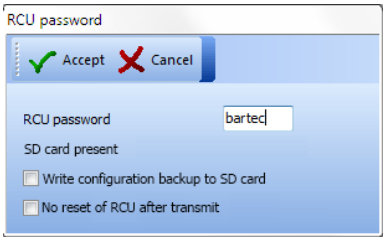


Language

Setting of the language for the ANTARES Designer (project interface).

Available Languages:

German, English, French, Italian, Portuguese (Brazilian), Spanish, Russian



Once the project transfer has started, the ANTARES Designer looks for the ANTARES system at the set COM interface and queries the RCU password.

On delivery, the password is “bartec”.

The successful or faulty transfer is reported by means of a dialog.

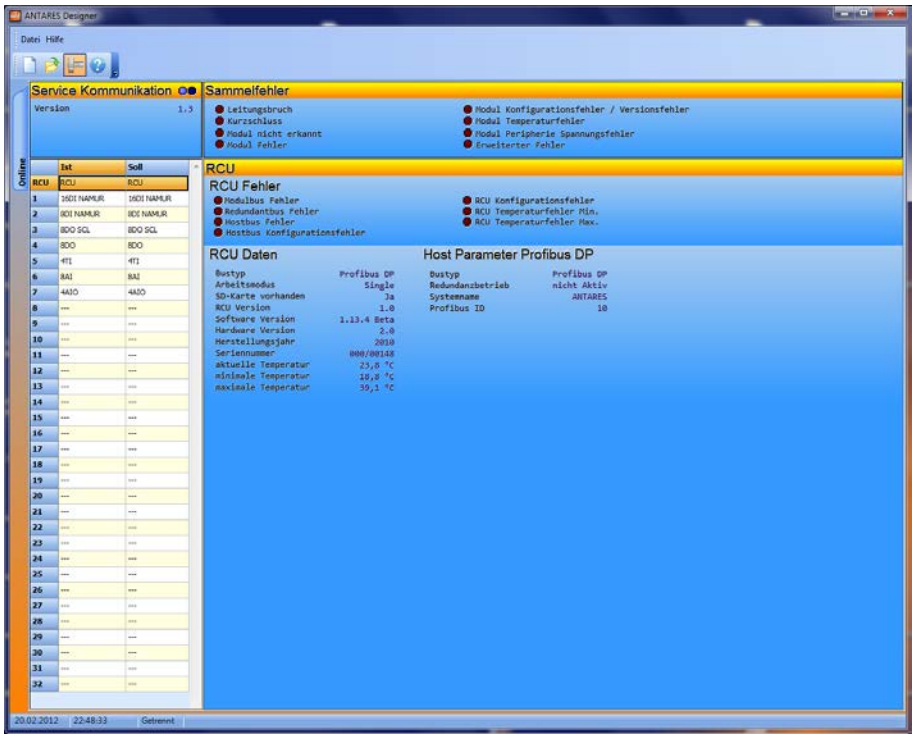
The ANTARES system automatically reboots to adopt the new settings (selectable).

If there are no configuration errors, the ANTARES system communicates with the control.

The parameters must be assigned to the control in accordance with the selected protocol.

▶ Please refer to the “Connection to Control” chapter.

9 ANTARES Online Diagnosis



This button brings you to the online view. Details on:

- Status data
- configuration data
- Input data
- Output data
- Extended information

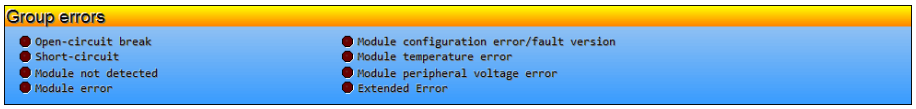
- ▶ There is no connection between the on-line view and the project (i.e. there is no need to open a project).
- ▶ There must be a connection via USB cable between the ANTARES system and the PC.
- ▶ It is not possible to change data.

9.1 Service Communication Area

The communication activity is indicated in the upper area of the dialog window.

- ▶ Communication protocol version.

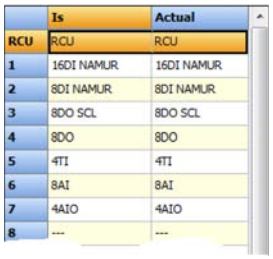
9.2 Group Error Area



An important area in the online diagnosis.

- ▶ Displays the faults in the system
  (a more precise view of the modules leads to the origin of the report)

9.3 RCU/Modules Actual/Setpoint Area

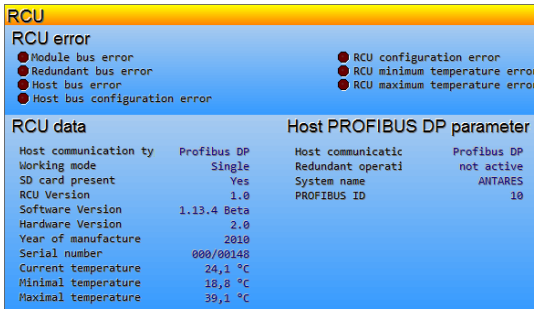


	Is	Actual
RCU	RCU	RCU
1	16DI NAMUR	16DI NAMUR
2	8DI NAMUR	8DI NAMUR
3	8DO SCL	8DO SCL
4	8DO	8DO
5	4TI	4TI
6	8AI	8AI
7	4AIO	4AIO
8	---	---

Overview showing:

Actual configuration and the setpoint configuration of the modules that are in use.
This representation shows if an incorrect module type and/or incorrect module place was used.
The specific module data are displayed when this line is clicked on.

9.4 RCU Area



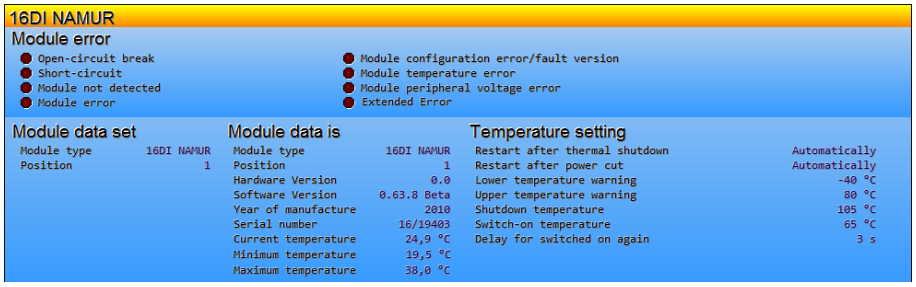
Overview showing:

Faults, data and parameters in the RCU.

The values displayed correspond to the RCU's host communication.

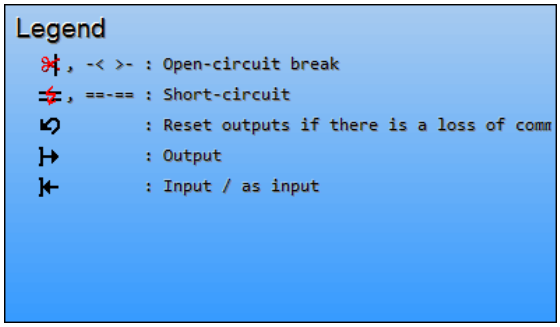
Example: PROFIBUS DP RCU data

9.5 Module Head Area



- ▶ Standard representation of the Remote I/O modules (header data)
- ▶ Shows a fault in the module
- ▶ Fault through channel: additional representation of the individual areas for each module

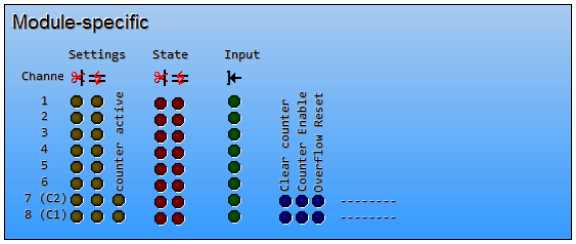
9.6 Module-Specific Area



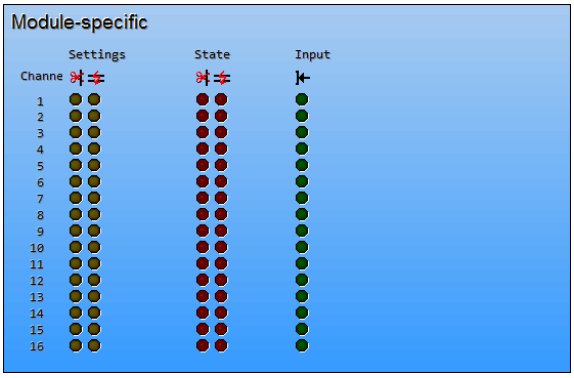
In the compressed display, the display takes the form of symbols

Example: overview/significance of the symbols

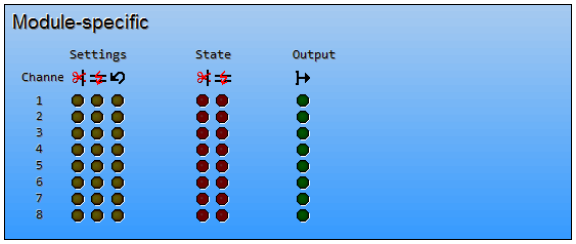
▶ Module 8DI



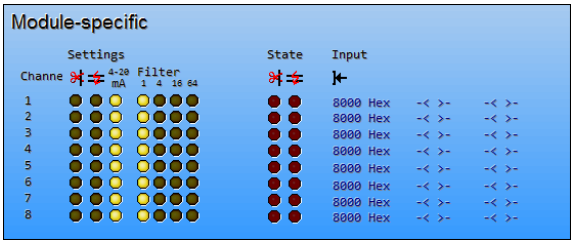
▶ Module 16DI



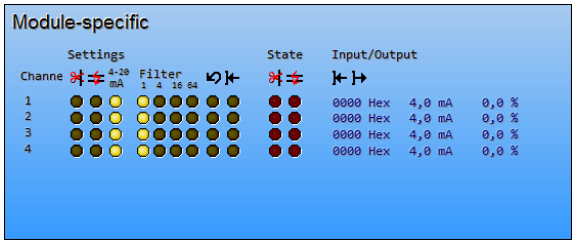
▶ Module 8DO / 8DO SCL



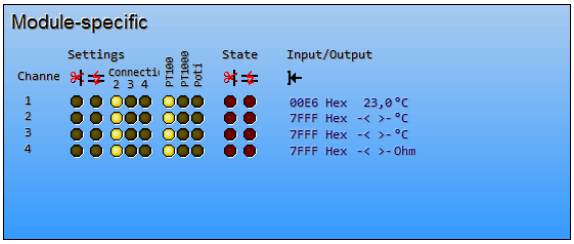
▶ Module 8AI / 8AIH



▶ Module 4AIO / 4AIOH



▶ Module 4TI

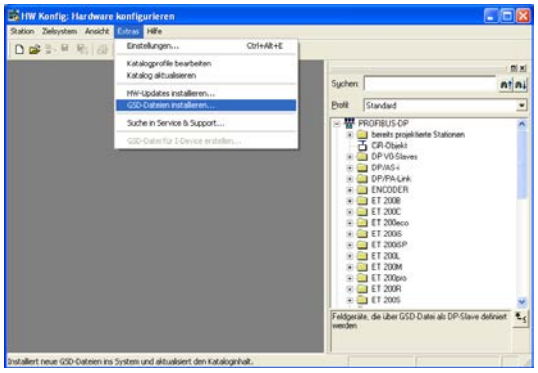


10 Connection to Control

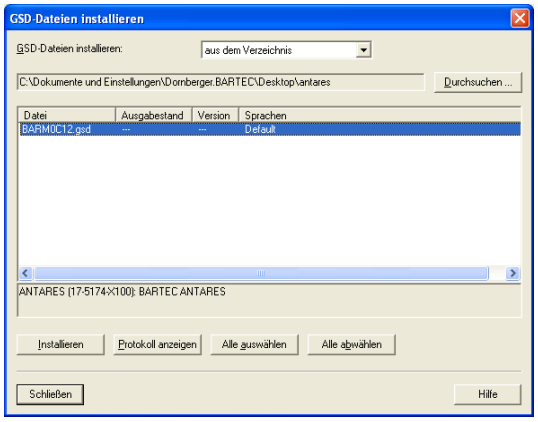
10.1 PROFIBUS DP

10.1.1 Siemens S7

Installation of the ANTARES GSD file

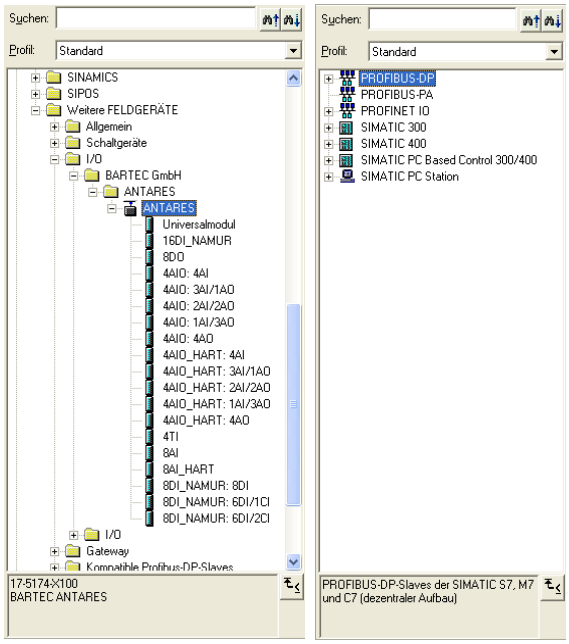


▶ Insert the GSD file into the Step 7.



▶ Select BARM0C12.GSD

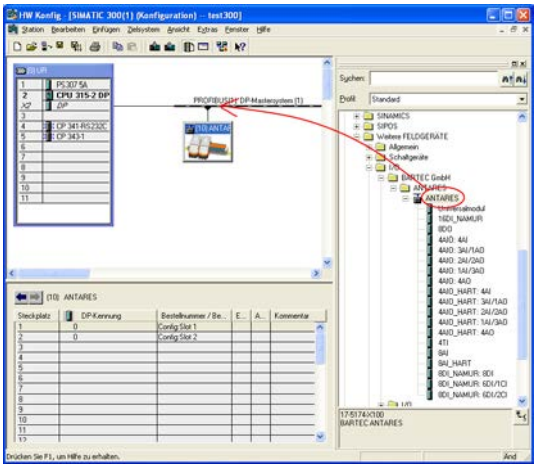
▶ Press the “Install” button.



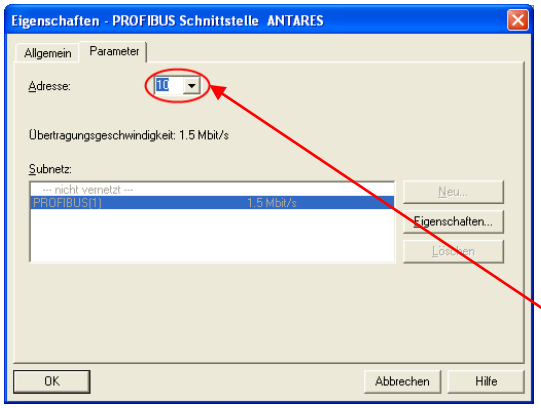
Filing after the installation of the ANTARES system:

▶ Device library

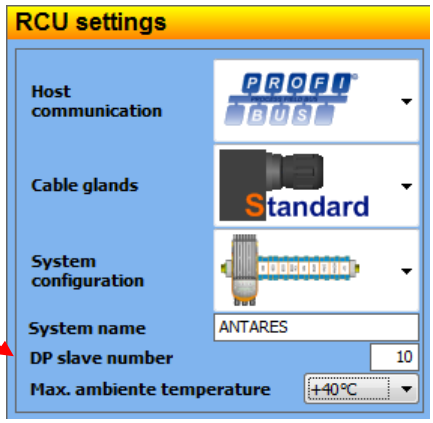
Insert the ANTARES system into the S7 project



▶ Insert the ANTARES RCU into the PROFIBUS DP.



▶ Enter the PROFIBUS DP slave address



Remote I/O area of the ANTARES system in Step 7

Steckplatz	DP-Kennung	Bestellnummer / Be...	E...	A...	Kommentar
1	0	Config:Slot 1			
2	0	Config:Slot 2			
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					

▶ Slots 1 and 2 are assigned.

▶ More slots are provided for the Remote I/O modules.

10.1.2 Inserting the Remote I/O modules (Configuration in the ANTARES Designer)

Example: system configuration

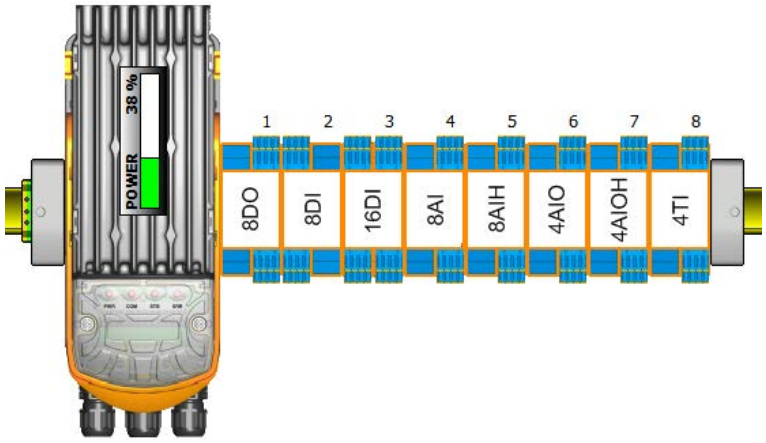
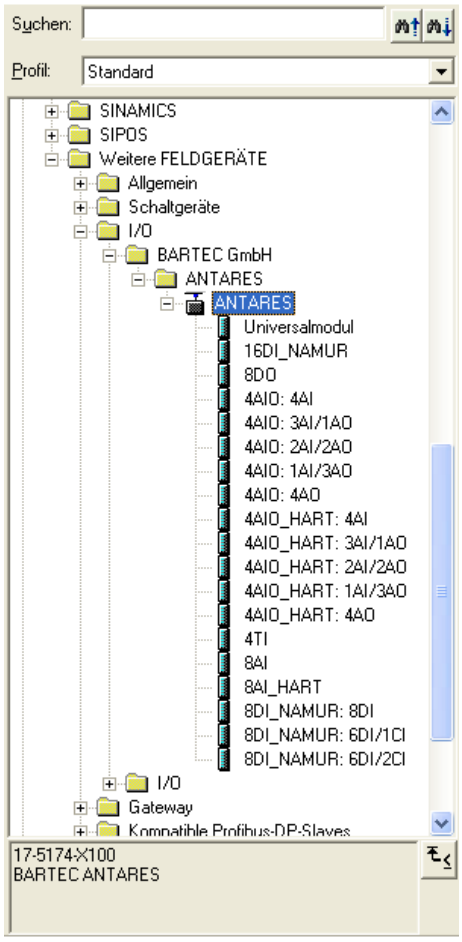
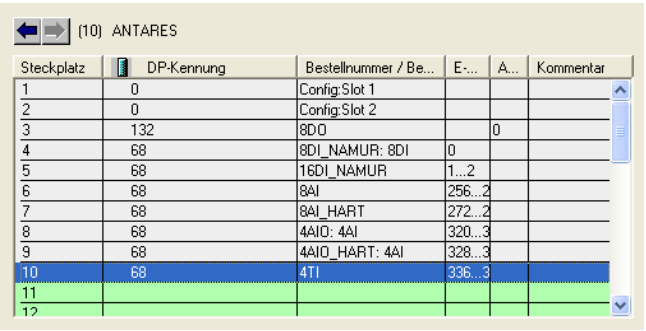


Illustration in the step 7

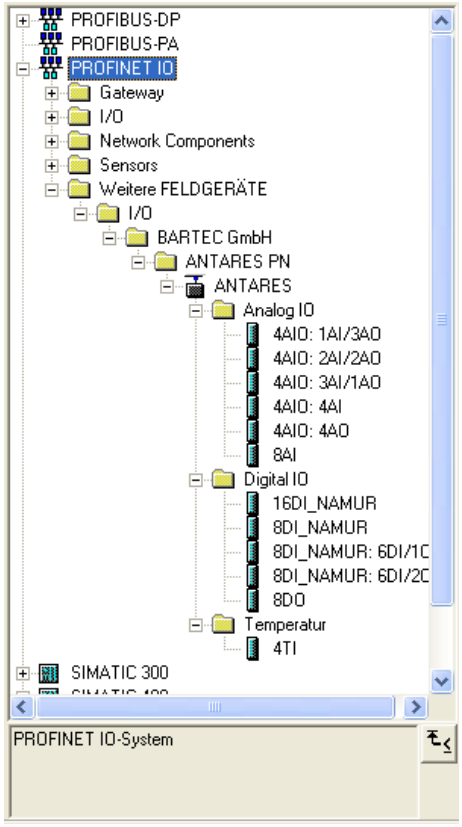
Configured system with Remote I/O modules (see sample configuration for the sequence of the inserted modules)

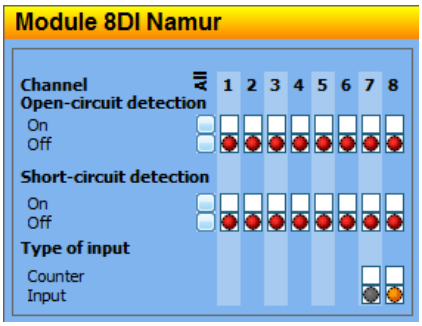




10.1.3 Special Features of the Remote I/O Module 8DI NAMUR

Select the variant from the "Step7 library".

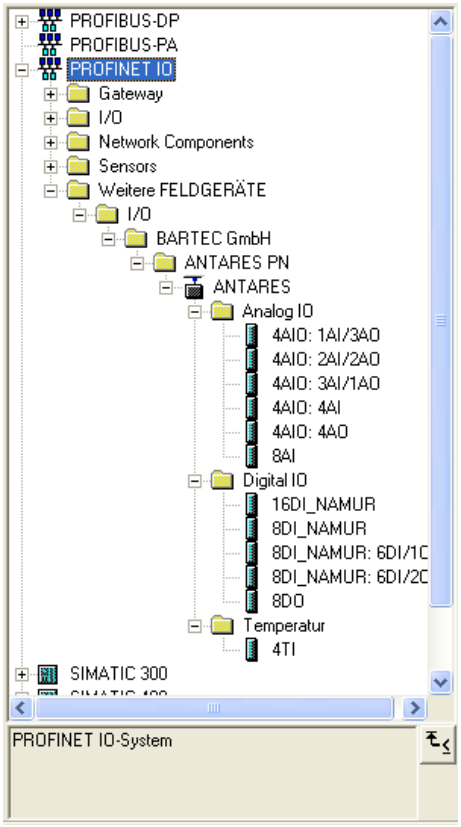


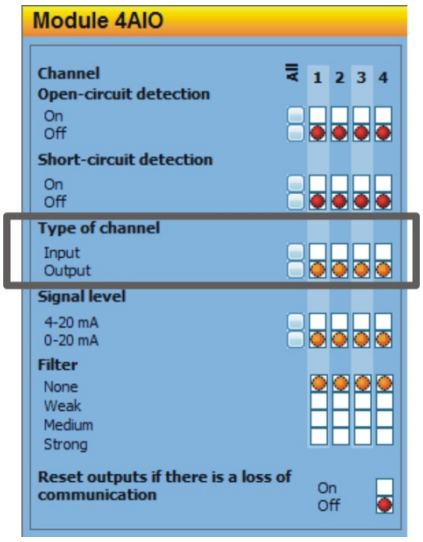


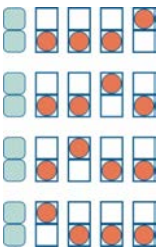
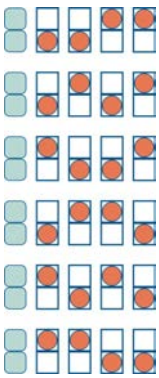
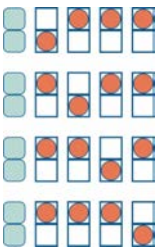
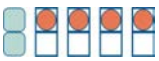
8DI_NAMUR Channels 1-8: inputs	8DI_NAMUR 7DI/1CI Channels 1-7: inputs Channel 8: counter	8DI_NAMUR 6DI/2CI Channels 1-6: inputs Channels 7-8: counter

10.1.4 Special Features of the 4AIO and 4AIOH Remote I/O Module

Select the variant from the "Step7 library". The channel selection is the same for the 4AIO remote I/O module and 4AIOH remote I/O module.





4AIO: 4AO no input 4 x outputs	4AIO: 1AI/3AO 1 x input 3 x outputs	4AIO: 2AI/2AO 2 x inputs 2 x outputs	4AIO: 3AI/1AO 3 x inputs 1 x output	4AIO: 4AI 4 x inputs no output
				

10.2 ProfiNet

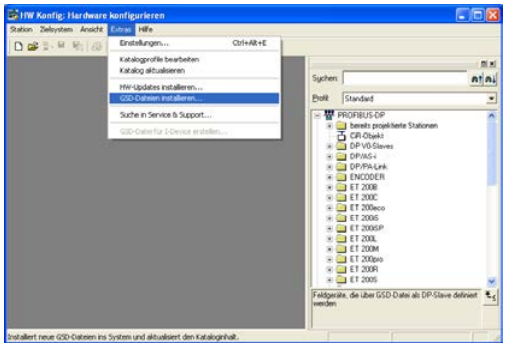
10.2.1 Siemens S7

Installation of the ANTARES-GSDML file

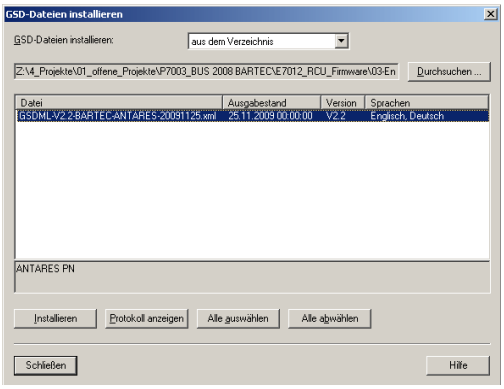
The ANTARES system can be integrated with the 5.4 SP5 and more recent versions of Step7.

A free update can be found on the WEB page:

http://support.automation.siemens.com/WW/llisapi.dll?func=cslib.csinfo&lang=de&objid=36476146&caller=view

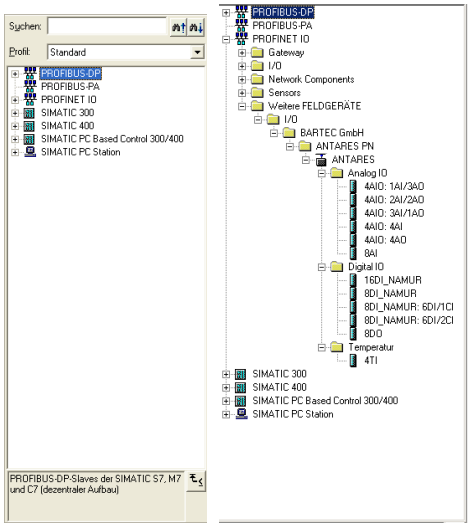


▶ Inserting the GSDML file into Step7.



▶ Select GSDML-V2.2-BARTEC-ANTARES-20091125.XML.

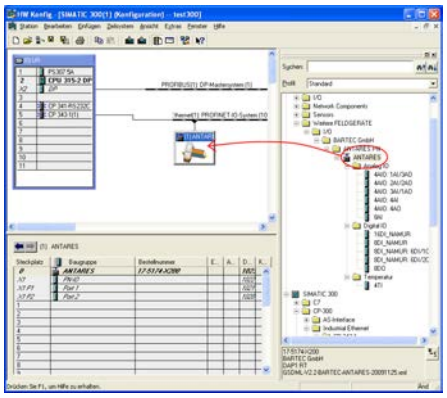
▶ Press the “Install” button.



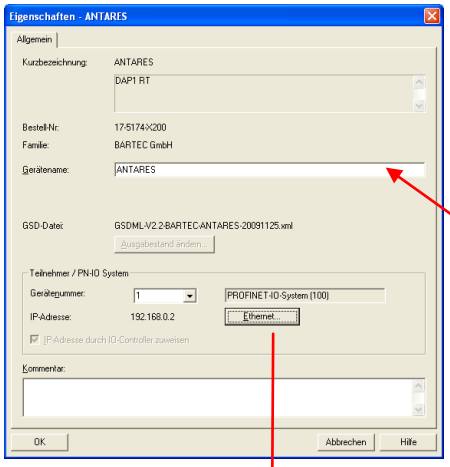
Filing after the installation of the ANTARES system:

▶ Device library

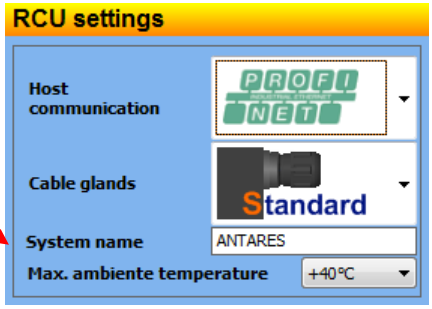
Insert the ANTARES system into the S7 project

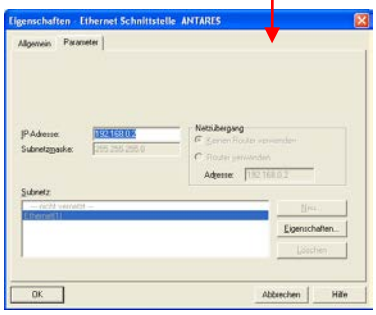


▶ Insert the ANTARES RCU into the PROFIBUS DP.



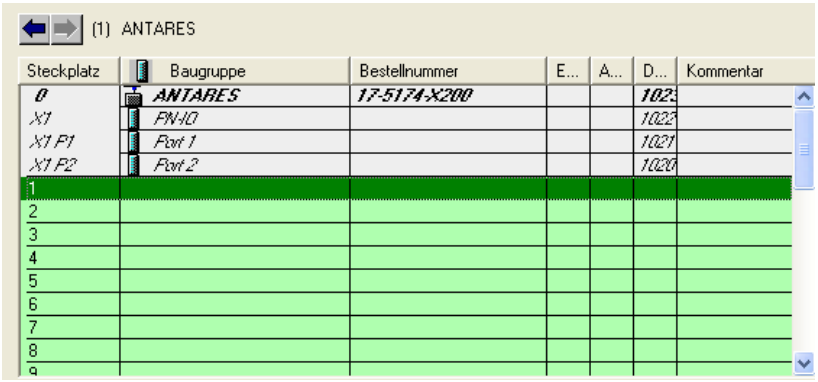
▶ The system name must be identical in the ANTARES system and in the control.





▶ Set the ANTARES IP address.

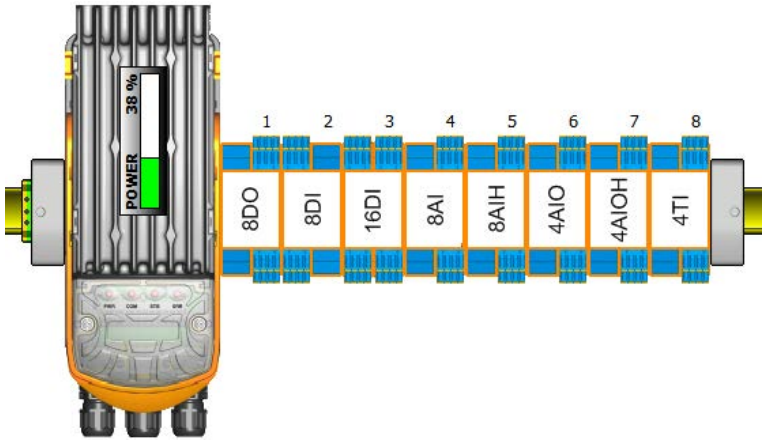
Remote I/O area of the ANTARES system in Step 7



▶ The other slots are intended for the Remote I/O modules.

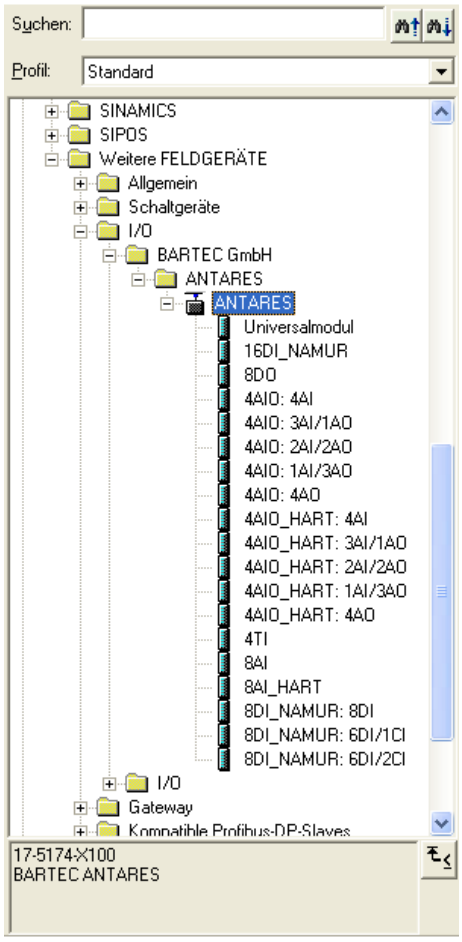
10.2.2 Insert the Remote I/O modules (configuration in the ANTARES designer)

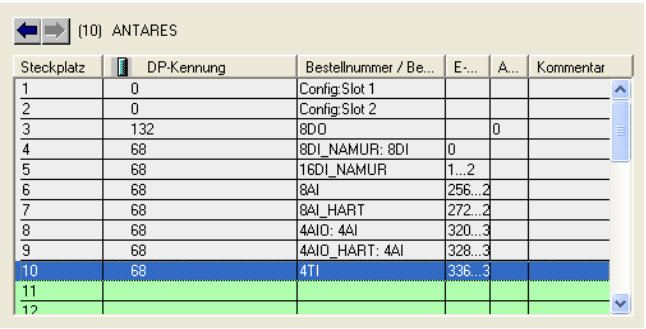
Example: system configuration



Representation in Step 7

Configured system with Remote I/O modules (see the sample configuration for the sequence of the inserted modules)

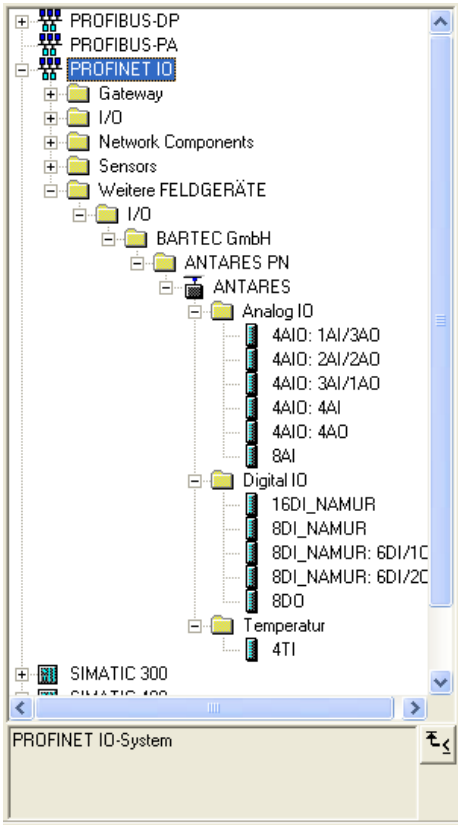


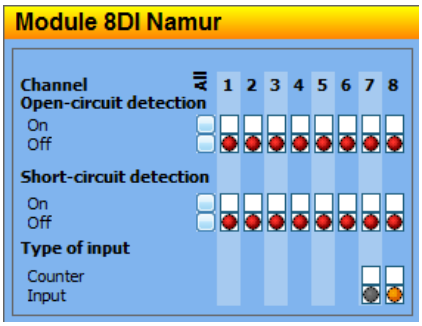


Steckplatz	DP-Kennung	Bestellnummer / Be...	E-...	A...	Kommentar
1	0	Config:Slot 1			
2	0	Config:Slot 2			
3	132	8DO		0	
4	68	8DI_NAMUR: 8DI	0		
5	68	16DI_NAMUR	1...2		
6	68	8AI	256...2		
7	68	8AI_HART	272...2		
8	68	4AIO: 4AI	320...3		
9	68	4AIO_HART: 4AI	328...3		
10	68	4TI	336...3		
11					
12					

10.2.3 Special Features of the 8DI NAMUR Remote I/O Modules

Select the variant from the "Step7 library".

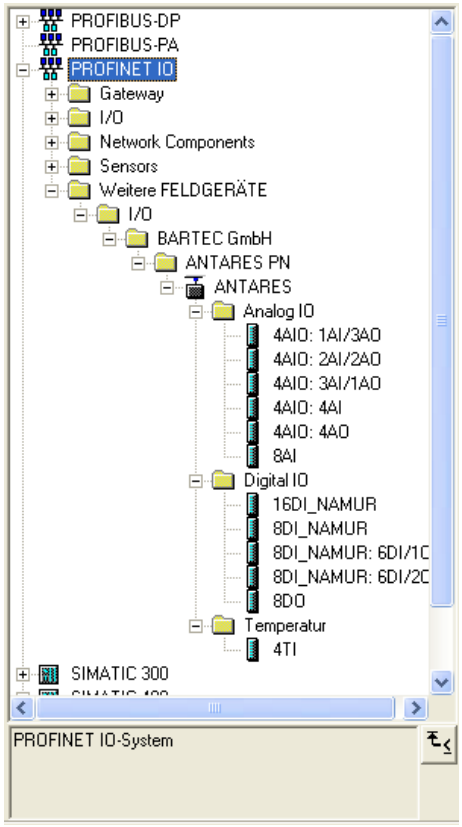


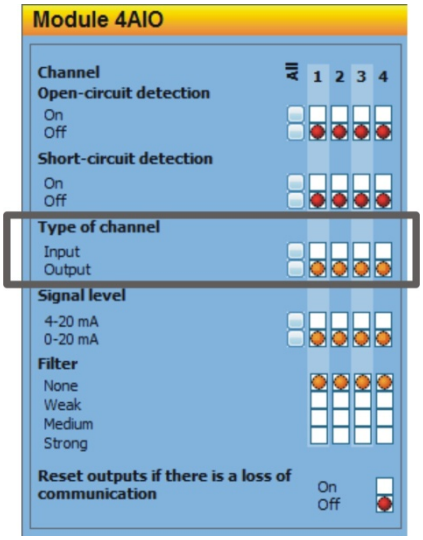


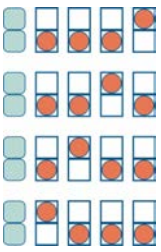
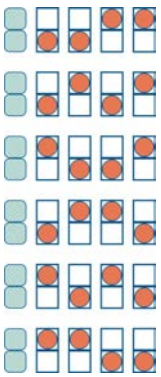
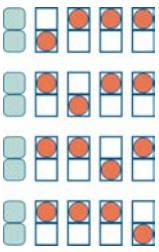
8DI_NAMUR Channels 1-8: inputs	8DI_NAMUR 7DI/1CI Channels 1-7: inputs Channel 8: counter	8DI_NAMUR 6DI/2CI Channels 1-6: inputs Channels 7-8: counters

10.2.4 Special Features of the 4AIO and 4AIOH Remote I/O Module

Select the variant from the “Step7 library”. The channel selection is the same for the 4AIO remote I/O module and 4AIOH remote I/O module.





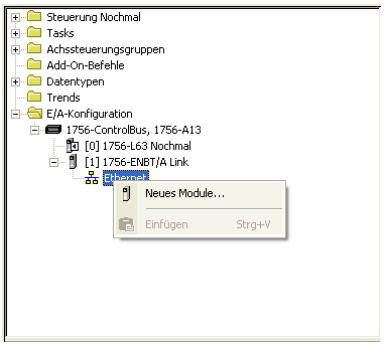
4AIO: 4AO no input 4 x outputs	4AIO: 1AI/3AO 1 x input 3 x outputs	4AIO: 2AI/2AO 2 x inputs 2 x outputs	4AIO: 3AI/1AO 3 x inputs 1 x output	4AIO: 4AI 4 x inputs no output
				

10.3 Ethernet/IP

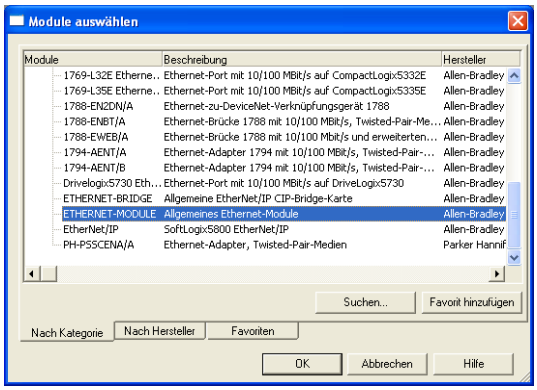
10.3.1 Example of a Rockwell Control

Info über RSLogix 5000
RSLogix 5000 Professional / Network Edition
Copyright (c) 2008 Rockwell Automation Technologies, Inc. All Rights Reserved
Version history :
V17.01.00 [CPR 9 SR 1]
This program licensed to:
Serial #
Activation Drive Lokal
Product Prefix 2022
Rockwell Automation contact information :
Business Phone 440-646-5800
Support Phone 440-646-3434
http://support.rockwellautomation.com
Warning: This computer program is protected by copyright law and international treaties. Unauthorized reproduction or distribution of this program, or any portion of it, may result in severe civil and criminal penalties, and will be prosecuted to the maximum extent possible under the law.
See the README file for additional copyrights.
More Info
OK

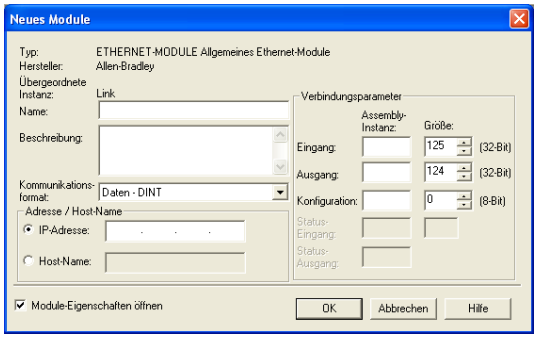
▶ Connection to the Rockwell control through Ethernet/IP with RSLogix 5000 Version 17 control software



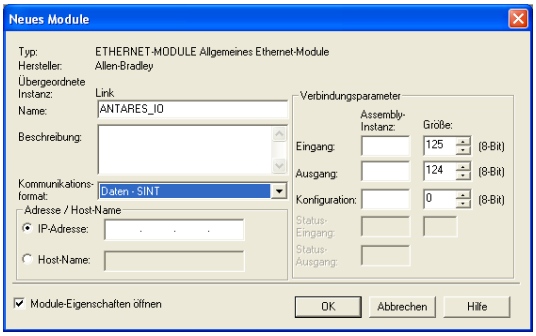
▶ Insert the new module.


Module auswählen
Module
Beschreibung
Hersteller
1769-L32E Etherne... Ethernet-Port mit 10/100 MBit/s auf CompactLogix5332E Allen-Bradley
1769-L35E Etherne... Ethernet-Port mit 10/100 MBit/s auf CompactLogix5335E Allen-Bradley
1788-EN2DN/A Ethernet-zu-DeviceNet-Verknüpfungsgerät 1788 Allen-Bradley
1788-ENBT/A Ethernet-Brücke 1788 mit 10/100 MBit/s, Twisted-Pair-Me... Allen-Bradley
1788-EWEB/A Ethernet-Brücke 1788 mit 10/100 MBit/s und erweiterten... Allen-Bradley
1794-AENT/A Ethernet-Adapter 1794 mit 10/100 MBit/s, Twisted-Pair-... Allen-Bradley
1794-AENT/B Ethernet-Adapter 1794 mit 10/100 MBit/s, Twisted-Pair-... Allen-Bradley
Drivelogix5730 Eth... Ethernet-Port mit 10/100 MBit/s auf DriveLogix5730 Allen-Bradley
ETHERNET-BRIDGE Allgemeine EtherNet/IP CIP-Bridge-Karte Allen-Bradley
ETHERNET-MODULE Allgemeines Ethernet-Module Allen-Bradley
EtherNet/IP SoftLogix5800 EtherNet/IP Allen-Bradley
PH-PSSCENA/A Ethernet-Adapter, Twisted-Pair-Medien Parker Hannif
Suchen...
Favorit hinzufügen
Nach Kategorie
Nach Hersteller
Favoriten
OK
Abbrechen
Hilfe

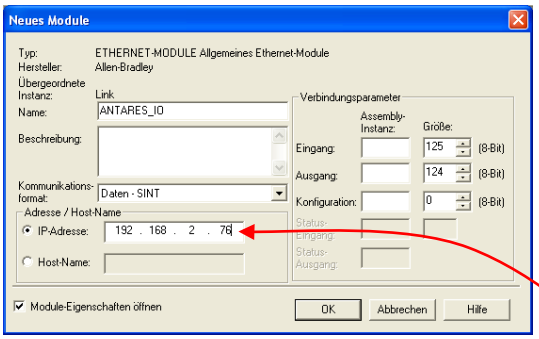
▶ The selection is made by means of a dialog. Select the “ETHERNET MODULE” (general Ethernet module).



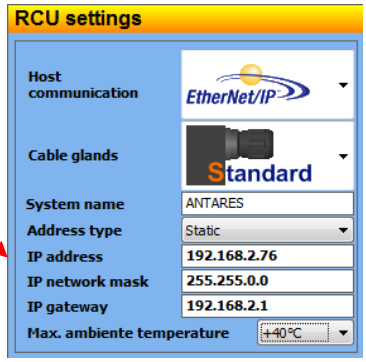
▶ Enter the IP address of the ANTARES System (see RCU settings for the project in the ANTARES Designer)

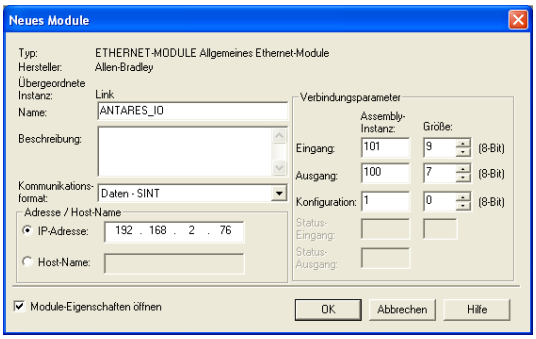


▶ The dialog window opens.



▶ Enter the IP address of the ANTARES System (see RCU settings of the project in the ANTARES Designer)





▶ In the “Assembly Instance” enter

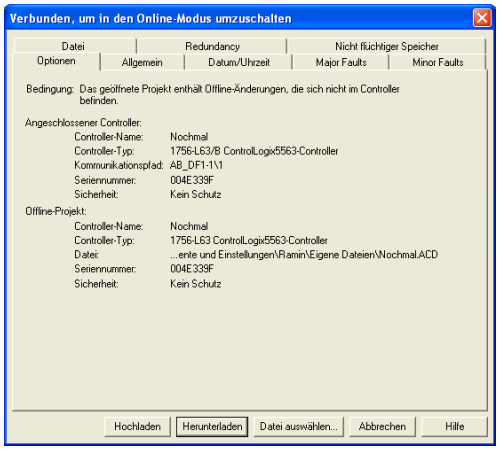
- the “101” value for input,
- the “100” value for output and
- the “1” value for configuration.

Module	Input	Output
8DI (no counters)	4 bytes	0 bytes
8DI (one counter)	8 bytes	1 byte
8DI (two counters)	12 byte	1 byte
16DI	7 bytes	0 bytes
8DO	3 bytes	1 byte
8AI / 8AIH	19 bytes	0 bytes
4AIO / 4AIOH (4 In, 0 out)	11 bytes	0 bytes
4AIO / 4AIOH (3 In, 1 out)	9 bytes	2 bytes
4AIO / 4AIOH (2 In, 2 out)	7 bytes	4 bytes
4AIO / 4AIOH (1 In, 3 out)	5 bytes	6 bytes
4AIO / 4AIOH (0 In, 4 out)	3 bytes	8 bytes
4TI	11 bytes	0 bytes

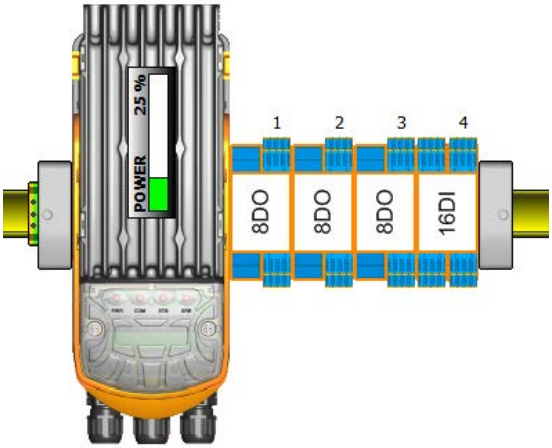
The values for the size must be determined on the basis of the table:

Input
4 + all input bytes of all modules

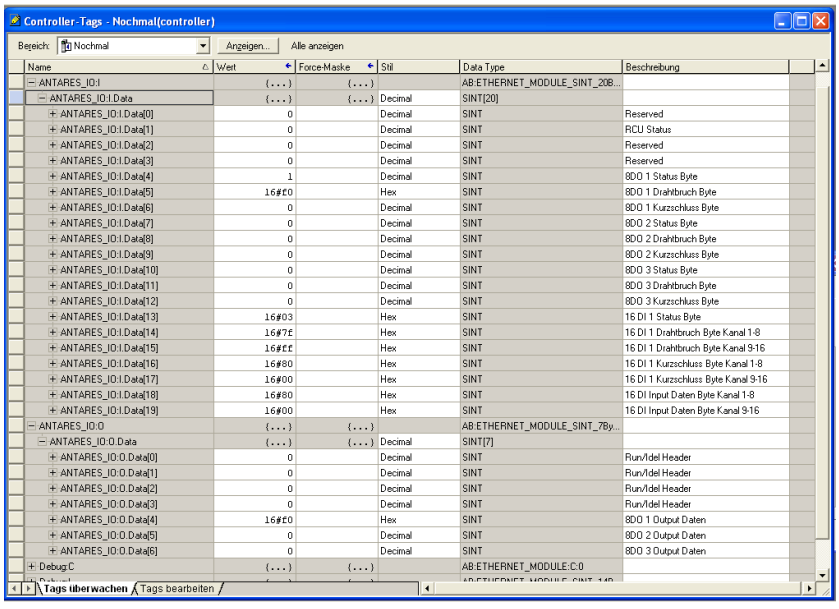
Output
4 + all output bytes of all modules
For the configuration always “0”



System configuration



Representation in the Rockwell control



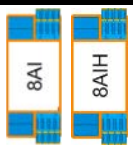
10.3.2 Detailed Table for the I/O Assignment of the Individual Modules

Each line corresponds to a byte

Module		Input	Output
	8DI no counters	Status	
		Open circuit	
		Short circuit	
		Inputs	
	8DI one counter	Status	Counter control
		Open circuit	
		Short circuit	
		Inputs	
		Counter 1, bits 1-8	
		Counter 1, bits 9-16	
		Counter 1, bits 17-24	
		Counter 1, bits 25-32	
	8DI two counters	Status	Counter control
		Open circuit	
		Short circuit	
		Inputs	
		Counter 1, bits 1-8	
		Counter 1, bits 9-16	
		Counter 1, bit, bits 17-24	
		Counter 1, bit, bits 25-32	
		Counter2, bit, bits 1-8	
		Counter2, bit, bits 9-16	
		Counter2, bit, bits 17-24	
		Counter2, bit, bits 25-32	

Module		Input	Output
	16DI	Status	
		Open circuit, channels 1-8	
		Open circuit, channels 9-16	
		Short circuit, channels 1-8	
		Short circuit, channels 9-16	
		Inputs, channels 1-8	
		Inputs, channels 9-16	

Module		Input	Output
	4TI	Status	
		Open circuit	
		Short circuit	
		Channel 1, bits 0-7	
		Channel 1, bits 8-15	
		Channel 2, bits 0-7	
		Channel 2, bits 8-15	
		Channel 3, bits 0-7	
		Channel 3, bits 8-15	
		Channel 4, bits 0-7	
		Channel 4, bits 8-15	

Module		Input	Output
	8AI / 8AIH	Status	
		Open circuit	
		Short circuit	
		Channel 1, bits 0-7	
		Channel 1, bits 8-15	
		Channel 2, bits 0-7	
		Channel 2, bits 8-15	
		Channel 3, bits 0-7	
		Channel 3, bits 8-15	
		Channel 4, bits 0-7	
		Channel 4, bits 8-15	
		Channel 5, bits 0-7	
		Channel 5, bits 8-15	
		Channel 6, bits 0-7	
		Channel 6, bits 8-15	
		Channel 7, bits 0-7	
		Channel 7, bits 8-15	
		Channel 8, bits 0-7	
		Channel 8, bits 8-15	

Module		Input	Output
	4AIO / 4AIOH	Status	
		Open circuit	
		Short circuit	
		First input channel, bits 0-7	
		First input channel, bits 8-15	
		Second input channel, bits 0-7	
		Second input channel, bits 8-15	
		Third input channel, bits 0-7	
		Third input channel, bits 8-15	
		Fourth input channel, bits 0-7	
		Fourth input channel, bits 8-15	
	4AIO / 4AIOH 3 in, 1 out	Status	First output channel, bits 0-7
		Open circuit	First output channel, bits 8-15
		Short circuit	
		First input channel, bits 0-7	
		First input channel, bits 8-15	
		Second input channel, bits 0-7	
		Second input channel, bits 8-15	
		Third input channel, bits 0-7	
		Third input channel, bits 8-15	

10.4 Modbus TCP

The implementation is based on the "MODBUS APPLICATION PROTOCOL SPECIFICATION V1.1b" description of 28 December 2006.
A Modbus TCP server is implemented in the RCU. The TCP Port 502 has a fixed setting.
Up to two connections to the ANTARES RCU are possible at the same time through this TCP Port 502.
The IP address and Netmask are defined by the ANTARES Designer or, if configured with parameters, they are assigned by a DHCP server.

Implemented Modbus function codes:
01 (0x01) read coils
02 (0x02) read discrete inputs
03 (0x03) read holding registers
04 (0x04) read input registers
05 (0x05) write single coil
06 (0x06) write single register
15 (0x0F) write multiple coils
16 (0x10) write multiple registers
23 (0x17) read/write multiple registers
ALL other function codes are acknowledged with a fault message in accordance with the Modbus specification.

Access is achieved by means of the function code which is divided as in the following:

Register addresses (decimal)	0XXXX	Input data
	1XXXX	Output data
	2XXXX	RCU status
	3XXXX	Module status
	4XXXX	Configuration

The following functions are treated differently than standard 1.1b:
Modbus® functions 01 "read coils" and 02 "read discrete inputs" behave in the same way.
Modbus® functions 03 "read holding register" and 04 "read input registers" behave in the same way.

10.4.1 Specifications of the Individual Address Areas in Detail:

Address area input data (0xxxxx):
The input data for the individual modules is made available in a continuous sequence for readout depending on the configuration. A write access leads to a fault and is acknowledged accordingly. A read access to an address area which is not assigned with module input data generates a fault.

Address area output data (1xxxxx):
The output data of the individual modules is made available for writing and reading in a continuous sequence depending on the configuration. Access to a memory area outside the module data generates a fault.

RCU status address area (2xxxxx):

- Adr 20000: RCU fault
- Adr 20001: reserved
- Adr 20002: number of modules
- Adr 20003→20035: 32 register for module types.
  Per register one module (hi-byte = main type, Lo-byte = subtype) Compare PROFIBUS/PROFINET.
  The register value = 0x0000 signifies that it is not assigned

Module status address area (3xxxxx)

- Status reports on the individual Remote I/O modules (length = number of modules x 3 words)

Configuration address area (4xxxxx)

- Adr 40000: timeout register in ms. Standard: 2000ms, timeout= 0 signifies that it is deactivated

Through the ANTARES Designer and depending on the module type and setting the modules occupy a different number of data words in the respective data area.

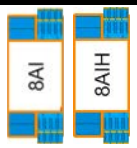
Overview

Module	Input	Output	Status
8DI (no counters)	1 word	-	3 words
8DI (one counter)	3 words	1 word	3 words
8DI (two counters)	5 words	1 word	3 words
16DI	1 word	-	3 words
8DO	-	1 word	3 words
8AI / 8AIH	8 words	-	3 words
4AIO / 4AIOH (4 in, 0 out)	4 words	-	3 words
4AIO / 4AIOH (3 in, 1 out)	3 words	1 word	3 words
4AIO / 4AIOH (2 in, 2 out)	2 words	2 words	3 words
4AIO / 4AIOH (1 in, 3 out)	1 word	3 words	3 words
4AIO / 4AIOH (0 in, 4 out)	-	4 words	3 words
4TI	4 words	-	3 words

Each line corresponds to a word

Module		Input	Output	Status
	8DI no counters	Inputs		Status
				Open circuit
				Short circuit
	8DI one counter	Inputs	Counter control	Status
		Counter 1, bits 16-31		Open circuit
		Counter 1, bits 0-15		Short circuit
	8DI two counters	Inputs	Counter control	Status
		Counter 1, bits 16-31		Open circuit
		Counter 1, bits 0-15		Short circuit
		Counter 2, bits 16-31		
		Counter 2, bits 0-15		

Module		Input	Output	Status
	16DI	Inputs, channels 1-16		Status
				Open circuit
				Short circuit

Module		Input	Output	Status
	8AI 8AIH	Channel 1		Status
		Channel 2		Open circuit
		Channel 3		Short circuit
		Channel 4		
		Channel 5		
		Channel 6		
		Channel 7		
		Channel 8		

Module		Input	Output	Status
	4AIO/4AIOH 4 in, 0 out	First input channel		Status
		Second input channel		Open circuit
		Third input channel		Short circuit
		Fourth input channel		
	4AIO/4AIOH 3 in, 1 out	First input channel	First output channel	Status
		Second input channel		Open circuit
		Third input channel		Short circuit
	4AIO/4AIOH 2 in, 2 out	First input channel	First output channel	Status
		Second input channel	Second output channel	Open circuit
				Short circuit
	4AIO/4AIOH 1 in, 3 out	First input channel	First output channel	Status
			Second output channel	Open circuit
			Third output channel	Short circuit
	4AIO/4AIOH 0 in, 4 out		First output channel	Status
			Second output channel	Open circuit
			Third output channel	Short circuit
			Fourth output channel	

Module		Input	Output	Status
	4TI	Channel 1		Status
		Channel 2		Open circuit
		Channel 3		Short circuit
		Channel 4		

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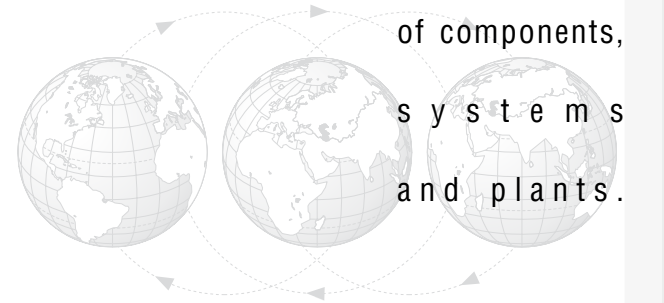

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